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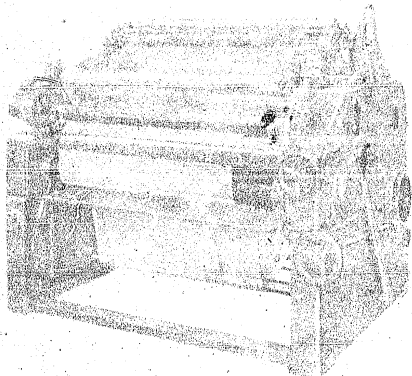
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*The shuttle-less jet loom.*

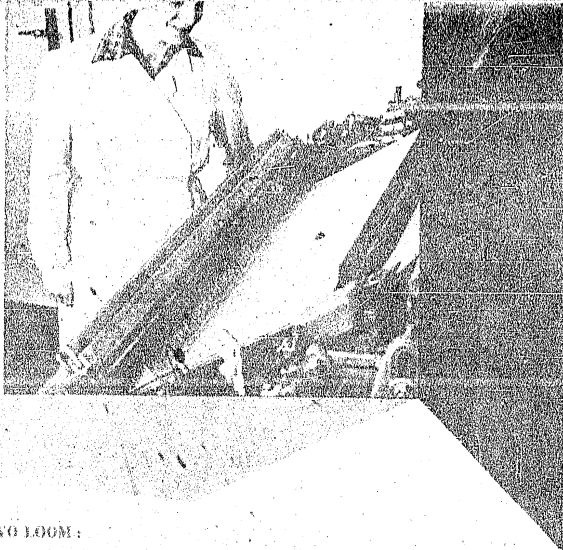
**KOVO**



*the machine which you  
have always longed for*

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## THE MAIN ADVANTAGES OF THE KOYO LOOM:

Compared with the former most efficient shuttle looms the jet loom attains double output -- 400 r. p. m.

It weighs only 900 kilos, which means that it is considerably lighter than an ordinary shuttle loom.

The loom requires a much smaller floor space, only 2.50 sq. metres, and this represents a very great economy in mill floor-space.

As the jet loom weaves direct from traverse wound cones no pirn winders are needed. In this you find another great money saver, there being no need to purchase automatic pirn winders, pirns, pirn cleaning machines, etc., and in addition you save further space in the winding department.

The consumption of electric power is considerably less.

There is no need of conditioning and water chambers.

Further great economies are gained as regards attendance. Less personnel are needed as there is no work for magazine fillers, winders and tube cleaners.

One of the main advantages is that the loom works absolutely noiselessly.

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## **T**HE KOVO SHUTTLE-LESS JET LOOM - THE MACHINE WHICH YOU HAVE ALWAYS LONGED FOR

From the old-fashioned loom, you now want the most modern jet loom. The weaver's dream and longing have now become reality. We offer the most efficient loom of the world and remove the noise, the greatest evil of the weaving mill, from the production of the most beautiful fabrics.

It is no mere accident that the new KOVO shuttleless loom, representing a revolutionary change into the evolution of weaving looms, has its origin in Czechoslovakia, the land where people have been engaged in the weaving trade since often times, and where fibers are made which possess tradition and a world-wide fame.

It can be said that the KOVO jet loom represents the result of the long years of work, studies and tests, and of careful scientific research.

The advantages of the jet loom as compared with the most efficient existing shuttle looms are far-reaching and offer you unprecedented possibilities and perspectives and, without any doubt, a great advantage over your competitors.

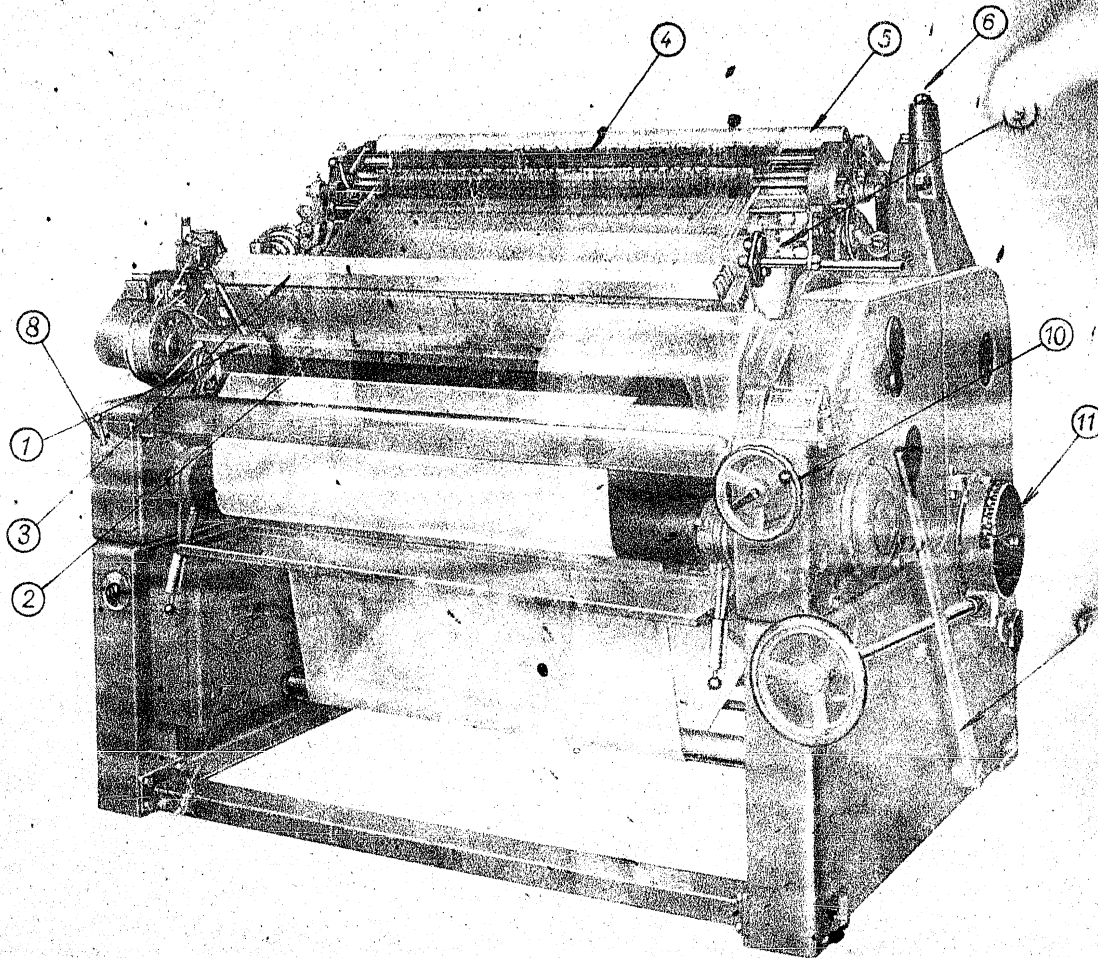
Therefore do not hesitate and equip your mill with the KOVO shuttleless looms.

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## Other Features for your further information:

As a result of perfect designing, all the elements which caused impacts on former looms have been removed.

The KOVO jet loom is equipped with quite new and purposefully designed mechanisms which do away with many of the uneconomical arrangements on the ordinary shuttle looms which can no longer satisfy the demands regarding output, attendance, required floor space, reliability of operation, and wear resistance of parts.



1. Picking mechanism
2. Reed
3. Harness
4. Warp stop motion

5. Back-rest
6. Signalling equipment
7. Drive of the loom
8. Starting lever

9. Selvage motion
10. Take-up motion
11. Let-off motion
12. Brakes

The smaller number of parts raises the technical capacity of the loom and lessens the possibility of stoppages. Maintenance becomes easier, maintenance costs cheaper, lower requirements of spare parts and their storage. The incline of the weaving plane into a suitably chosen angle, which facilitates attendance and reduces the floor space covered by the loom, represents another radical change. Easy reach of the warp stop motion makes it possible for the weaver to repair immediately most yarn breakages without walking round the loom, which results in a higher output of the loom.

Another feature of this machine is the arrangement of the warp beam and the cloth beam, which are located one above the other at the rear of the machine so that they can be transported through one single passage and the weaver need not be disturbed in his work.

Unnecessary and undesirable exertion and noise disappear and the life of the machine is prolonged.

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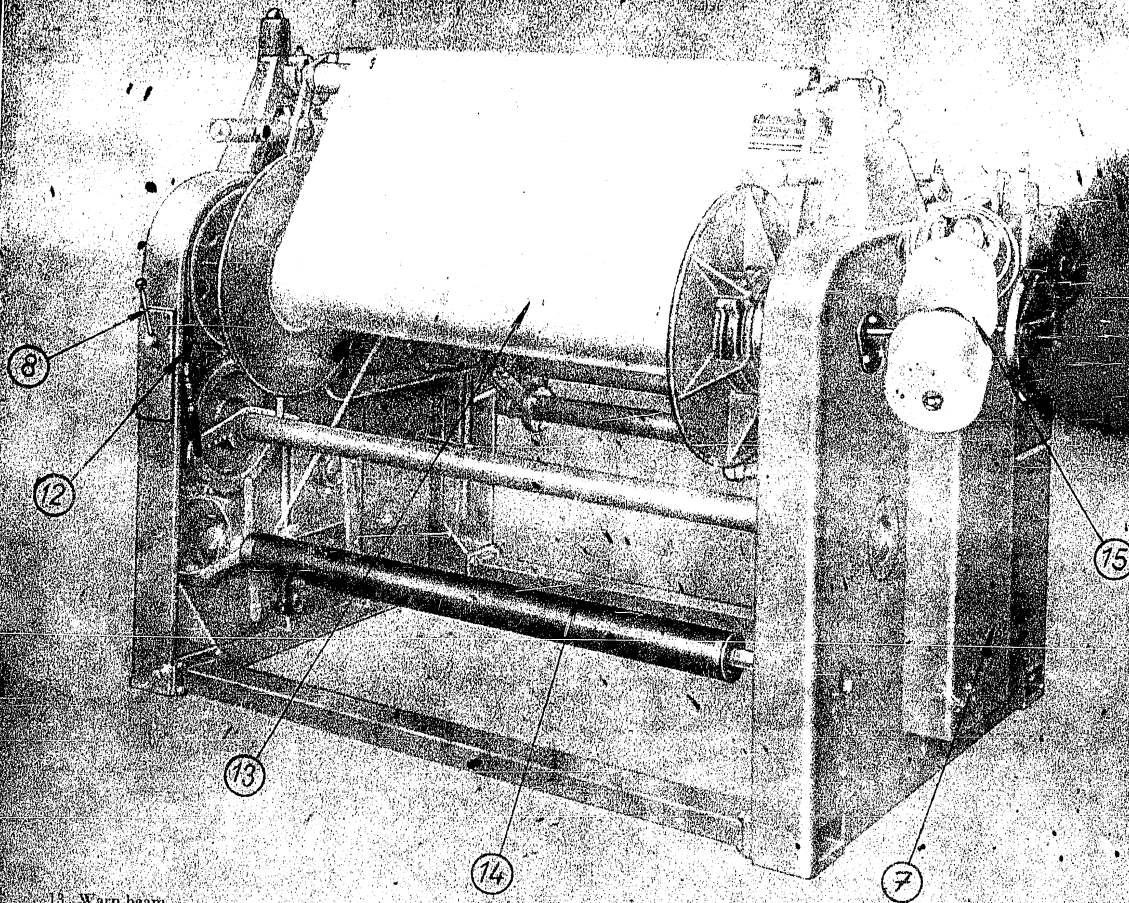
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The absence of a shuttle makes it possible to reduce the size of the shed and to shorten the beating up of the reed. The resulting reduced stress on the warp and the weft threads allows the working of materials which have no great strength. It also reduces the frequency of warp or weft breakages and thus increases the efficiency of the loom.

Due to the absence of a shuttle-box and the mechanisms connected with the picking device, the number of parts in a jet loom is greatly reduced which results in the attainment of a very simple design.

The direction of the sley motion towards the line of the machine ensures stability and noiseless operation even at high speeds, and allows weaving to be carried out without the loom being halted to the floor.

The loom does not reach above the average eye height of an operator so that a mill equipped with these looms is easy to be supervised and good illumination is ensured in daylight as well as in artificial light.



- 13. Warp beam
- 14. Cloth beam
- 15. Location of cross-wound wound bobbin
- 16. Rear starting lever

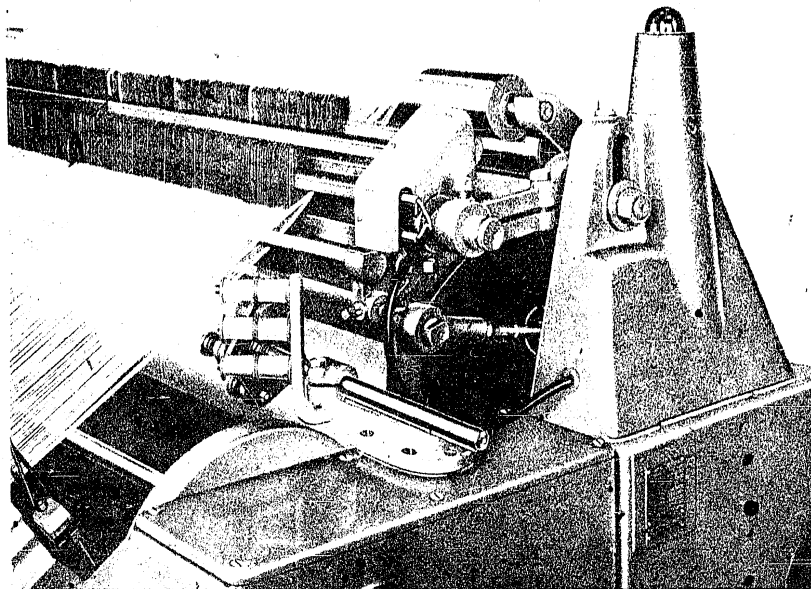
The design is of advantage for assembling and carrying out of repairs so that individual mechanisms can be repaired away from the machine (for instance the driving mechanism can be completely replaced).

#### Description of the Loom:

The Loom is intended for weaving glass fibres, polyamid staple, doubled and cotton warps. It is of robust box-type design and fully balanced in operation so that even at the highest speed of 400 r.p.m. it need not be fixed to the floor. The gears are located in a sealed oil bath. The shafts run in self-lubricated bearings or ball bearings so that the demands as to lubrication are minimal. Parts which come into contact with water are of rust resisting materials or are surface protected.

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The Warp Beam is located above the cloth beam at the rear of the machine and has been chosen with a maximum beam diameter of 700 mm (27 1/2"). Its flanges are of aluminum and the diameter of the beam tube is 150 mm (6").

The Let-off Motion is suitable for every kind of material. It requires small attendance or up-keep. It is a differential hand brake with a torsion spring (see fig. 3).

It ensures fine and regular letting off and smooth oscillation of the beam even at the highest speed. The regulation of the brake tension is performed from the working position of the weaver by means of a hand wheel situated on the right hand side of the loom. Quick releasing of the warp is also performed from here. (See Fig. 2.)

The Back-Rest consists of two rotary seated rollers, the position of which is adjustable in height and in depth. It can be used as a firm, spring loaded, floating, or floatingly spring loaded back-rest. It is

designed so as not to be influenced by the reducing of the beam diameter. (See Fig. 1.)

The Warp Stop Motion is electrical and of the four-row type. By means of a control lever on the left hand side the position of the breakage can be as easily found as with a mechanical warp stop motion. (See fig. 1.)

The Harness is completely of metal and of normal design. The position, timing and size of the shed is adjustable. The head-shafts are all of metal, precision seated and easily exchangeable. Length of heads: 220 mm (8 3/4").

The Reed is soldered and made of stainless material. It is 110 mm (4 1/4") high and fitted into a slay of light construction. The absence of a shuttle allows the use of finer reed wires, an advantage when working with very fine yarns or yarns of irregular thickness. (See Fig. 1.)

The Take-up Motion is of multiple parcel type, and in a range of 10 - 50 picks, no parts need be exchanged. The number of picks can be adjusted by means of an adjusting screw. An oscillation of one gear is necessary above or below this pick range. Instead of a sand roller the loom is provided with two rubber coated rollers which tension the cloth. Their pressure can be adjusted by a lever. They are attached to the take-up motion and also press out surplus moisture from the fabric.

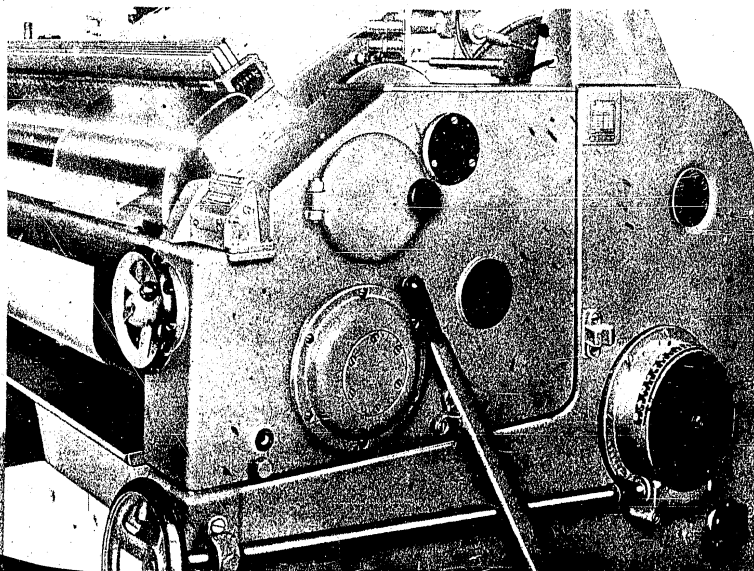
The Cloth Winding is negative. The maximum diameter of the wound cloth beam is 500 mm (20"). Instead of a wooden beam, a tube of synthetic substance is used which is easily removable on the rear of the machine, even during the operation.

The Picking Mechanism is of special design and adjustable for all kinds of the usual wefts. It is located on the left hand side wall of the loom and works with minimum stress of the weft yarn. The weft is fed from a cross-wound cone seated on the side wall of the loom and accessible from the rear as well as from the front passage. The swivelling cone holder enables an easy exchange of the cones and the donning of spare bobbins away from the weaver's operating position. The whole picking mechanism works reliably.

It is adjustable according to a cyclical diagram and therefore

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its setting up does not require any skill or qualification of the operator. (See Fig. 1.)

The **Web Stop Motion** is seated on the right selvage end and gives an electric impulse for stopping the machine.

**Leno Selvage Motion.**

The Loom is started by means of a lever on the left hand side wall of the loom or from the rear of the machine, where another starting lever is located on the opposite side wall.

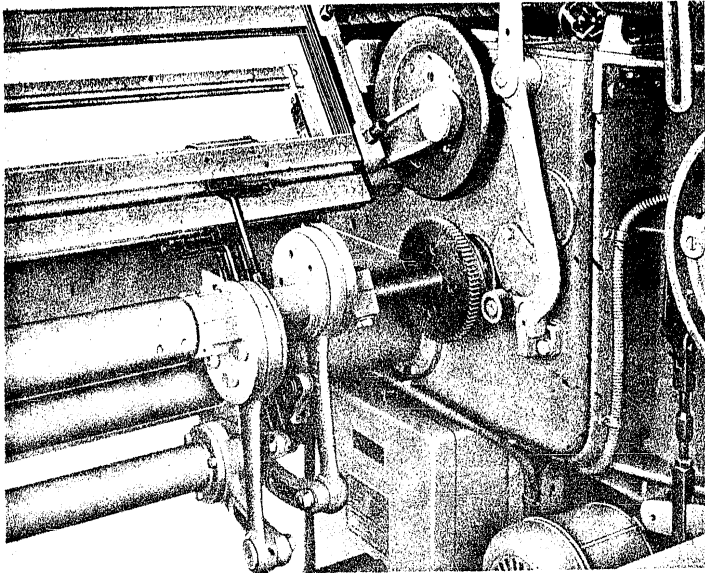
**Stopping of the loom** is performed by the starting levers.

The **Loom Brake** is highly effective so that the machine stops within one revolution.

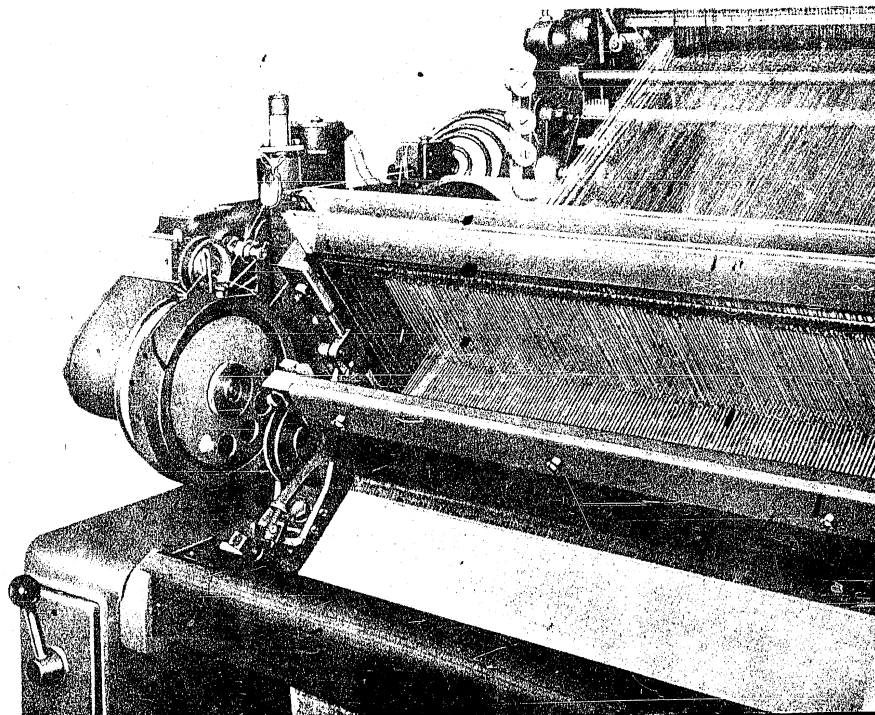
**Signalling Equipment.** On the right side wall there is a dial counter indicating the number of woven metres with a precision allowance of 0.1 metre (4"). The length of the piece can be adjusted as required. The machine stops automatically when the piece has been woven and lights a red lamp which is fitted at the highest point of the right hand side wall and signals to the attendant who is in charge of the fabric delivery. (See Fig. 1.)

The **Electric Installation** is accommodated in a self-contained tightened box. The wiring runs in armoured cables.

The **Drive** is effected by a motor of standard type, 1400 r. p. m., 0.27 - 0.15 kW. The principle of the machine allows slow starting and therefore the motors need not be of high starting torque.



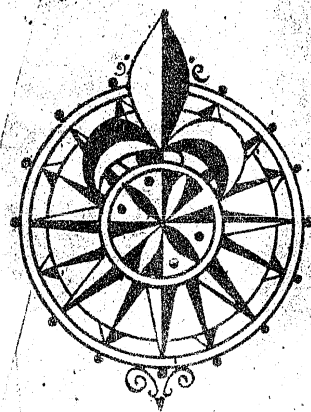
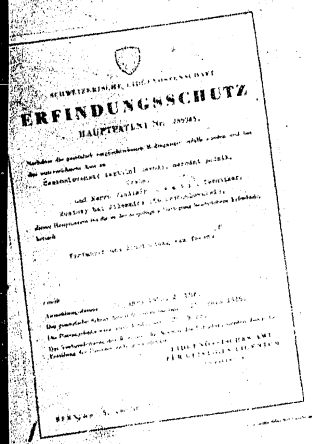
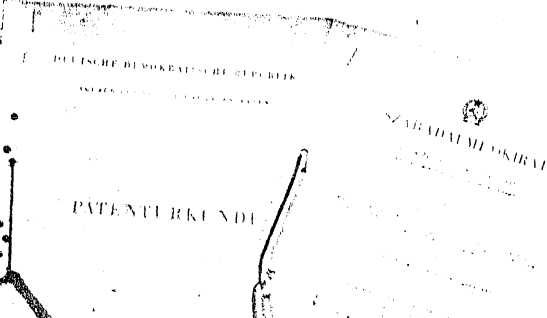
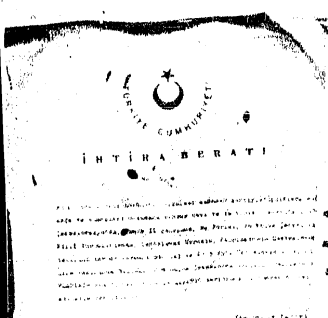
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**Main Technical Data:**

|   |                    |              |
|---|--------------------|--------------|
| Reed width (Working width conformingly) | 105 cm             | 41 1/2"      |
| Working speed                           | 400 r. p. m. max.  |              |
| Power consumption                       | 0.25 — 0.45 kW.    |              |
| Weight of machine net                   | 9 q                | 1984 lbs     |
| Weight of machine gross                 | 13 q               | 2866 lbs     |
| Floor space taken up                    | 2.5 sq. m.         | 2.98 sq. yds |
| Weaves                                  | plain              |              |
| Stop motions                            | electrical         |              |
| Motor                                   | 220/380 V, 0.45 kW | 1400 r.p.m.  |

As improvements are constantly being carried out the technical data of this leaflet are not binding. The new KOVO shuttle-less jet loom is indisputably a machine of world wide significance marking a revolutionary change in the production of weaving looms. It has been patented in all countries because the interest it has aroused all over the world is really extraordinary. The loom is the result of long years of experiences in textile production and in the production of weaving looms of the most modern conception and eliminates all the disadvantages of shuttle looms. We shall be glad to supply you also. Ask for our offer.

**KOVO. PRAHA - CZECHOSLOVAKIA**

ČOK 32118 a - 5408 - Sčt 04 - 998

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Whereas Vladislav Svoboda, of Hradec, near Brno, Czechoslovakia, assignor of seventy five per cent to Československé Textilní Závody, narodní podnik, of Prague, Czechoslovakia, a company of Czechoslovakia,

has caused these Letters Patent to be signed by me, the undersigned, Secretary of the Patent Office, in and to the effect and to the tenor hereof, full power in that behalf being in that behalf first lawfully reposed in me by the Board of Patent Commissioners and by the Senate of the United States of America;

Know all men by these presents, that I, the said Secretary of the Patent Office, do hereby certify and attest that the said Vladislav Svoboda, his heirs or assigns, and Československé Textilní Závody, narodní podnik, its successors and assigns, for the term of SEVENTEEN years from the date of this patent, have the sole and exclusive right, title and interest in and to the said invention, the nature and character of which is hereinafter set forth.

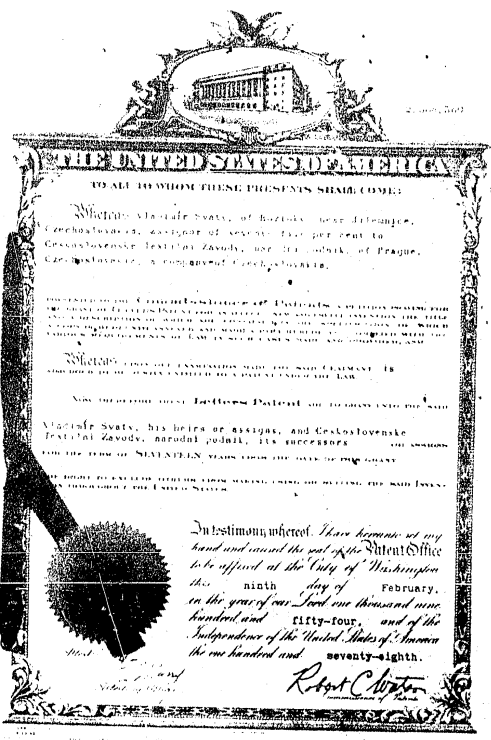
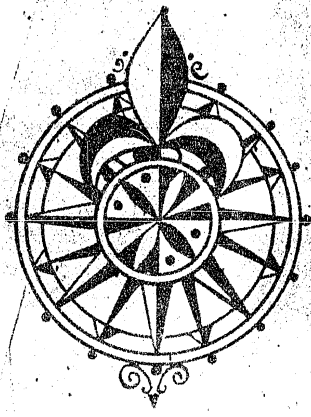
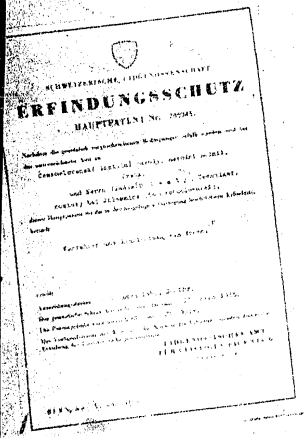
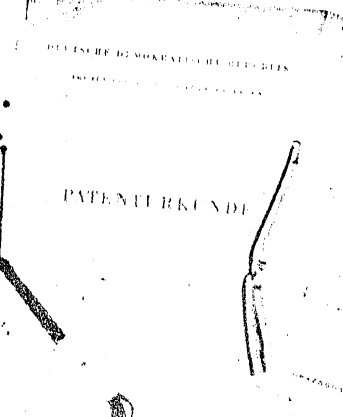
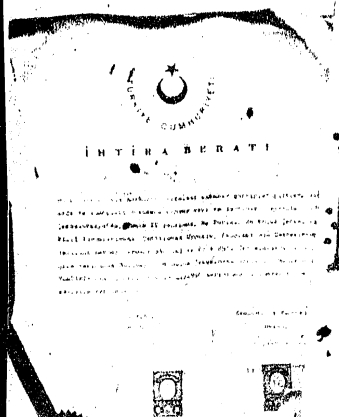
In testimony whereof, I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the City of Washington, this ninth day of February, in the year of our Lord one thousand nine hundred and fifty-four, and of the Independence of the United States of America the one hundred and seventy-eighth.

*Robert Clayton*

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Printed in Czechoslovakia

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**Main Technical Data:**

|   |                   |                     |
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| Weaves                                  | plain             |                     |
| Stop motions/ electrical                |                   |                     |
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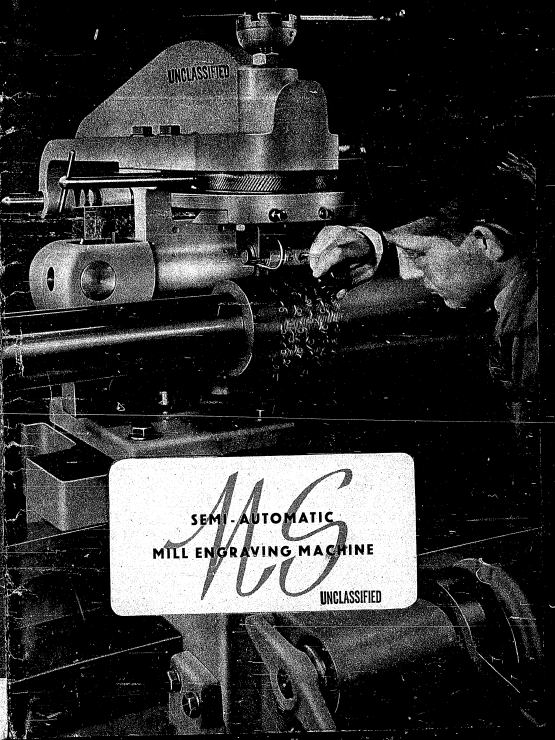
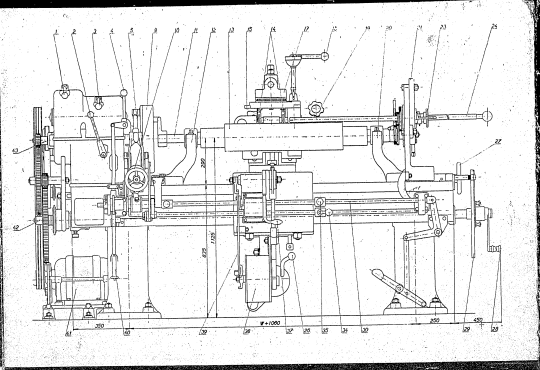
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**KOVO, PRAHA - CZECHOSLOVAKIA**

ČOK 32118 a - 5408 - S61 04 - 996

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Printed in Czechoslovakia



TECHNICAL DATA:

|  | MS 1                    | MS 2                    |
|--|-------------------------|-------------------------|
| MAXIMUM LENGTH OF PRINTING ROLLER        | 1200 mm                 | 1600 mm                 |
| MAXIMUM CIRCUMFERENCE OF PRINTING ROLLER | 1000 mm up to           | 1550 mm                 |
| NUMBER OF SPINDLE SPEEDS                 | 12                      | 12                      |
| RANGE OF SPINDLE SPEED                   | 8 - 300 r. p. m.        | 8 - 300 r. p. m.        |
| INPUT OF MAIN MOTOR                      | approx. 3.25, 1/3, 1 kW | approx. 3.25, 1/3, 1 kW |
| SPEED OF MOTOR                           | 720/900 r. p. m.        | 720/900 r. p. m.        |
| MOTOR INPUT FOR THE MILL LIFTING         | 0.5 kW                  | 0.5 kW                  |
| HEIGHT OF CENTERS                        | 290 mm up to            | 330 mm                  |
| HEIGHT OF BED                            | 650 mm                  | 650 mm                  |
| NET WEIGHT approx. kg                    | 600                     | 510                     |
| GROSS WEIGHT approx. kg                  | 650                     | 560                     |
| STANDARD SPACE                           | approx. 3.0 m           | approx. 3.0 m           |

Our machines are always subject to improvements, therefore, pictures and data in our leaflets are not binding.

To enable us to make a precise offer please state in your enquiry:

1. The minimum and maximum circumference of the printing rollers.
2. The minimum and maximum length of the printing rollers.
3. The bore on both ends of the printing roller.
4. The voltage available on your premises.

SEMI-AUTOMATIC  
MILL ENGRAVING MACHINE  
UNCLASSIFIED

**KOVO** PRAHA - CZECHOSLOVAKIA

**STANDARD EQUIPMENT**

- 1. THE PHOTO ENGRAVING DEVICE which is a removable part of the machine provides still greater possibilities of work on the standard version of the semi-automatic mill engraving machine.
- 2. The device is made in two weight levels with 18 weights, 30 weights, ready for printing, the device for lighting motor, lighting the press on the side and the following accessories:
- 3. 2 gears of the belt drive.
- 4. 2 gears of the belt drive for 24, 24, 24, 24 mm diam.
- 5. 2 gears of the belt drive for 30, 30, 30, 30 mm diam.
- 6. 1 gear for the drive of the printing roller.
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**SPECIAL EQUIPMENT**

- 1. A photo engraving device consisting of the same equipment in which the lamp holder is accommodated, but the holder is replaced by a lamp holder which can be operated with the machine, the range of printing.
- 2. A special lighting gear for coupling into the mechanism of the mill engraving machine.
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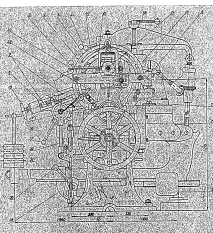
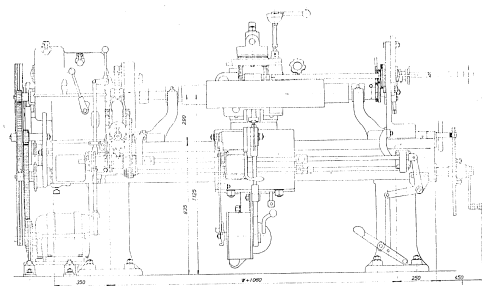
**TECHNICAL DATA:**

|  | MS 1                     | MS 2    |
|--|--------------------------|---------|
| MAXIMUM LENGTH OF PRINTING ROLLER        | 1500 mm                  | 1600 mm |
| MAXIMUM CIRCUMFERENCE OF PRINTING ROLLER | 1000 mm                  | 1100 mm |
| RANGE OF SPINDLE SPEEDS                  | 12                       |         |
| RANGE OF SPINDLE SPEED                   | 8 300 r.p.m.             |         |
| INPUT OF MAIN MOTOR                      | approx. 2.2 / 2.2 / 1 kW |         |
| SPEED OF MOTOR                           | 1700/1600 r.p.m.         |         |
| MOTOR INPUT FOR THE MILL LIFTING         | 0.3 kW                   |         |
| HEIGHT OF CENTERS                        | 170 mm                   | 180 mm  |
| WIDTH OF BED                             | 600 mm                   |         |
| NET WEIGHT (approx. kg)                  | 4000                     | 5100    |
| GROSS WEIGHT (approx. kg)                | 4500                     | 5500    |
| PRINTING SPACE                           | approx. 3 cm. width      |         |

Our machines are always subject to improvements, therefore, pictures and data in our leaflets are not binding.

To enable us to make a precise offer please state in your enquiry:

1. The minimum and maximum circumference of the printing rollers.
2. The minimum and maximum length of the printing rollers.
3. The bore on both ends of the printing rollers.
4. The voltage available on your premises.



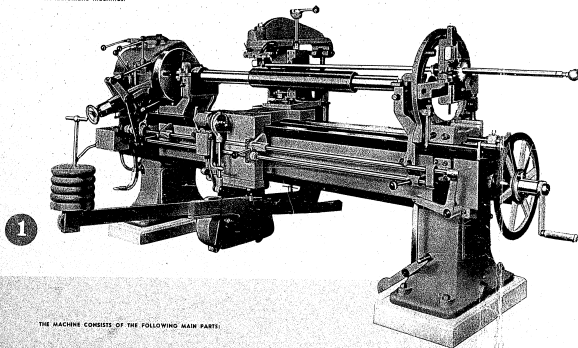
- 1. RELEASING THE PAUSE FEED.
- 2. POSITIONING THE SHARPER OF THE LEAD STOCK.
- 3. SPEED CHANGING LEVER.
- 4. OPERATING THE MOTOR.
- 5. STOPPING MOTOR ON THE STOP.
- 6. STOPPING MOTOR ON THE STOP.
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- 50. STOPPING MOTOR ON THE STOP.



**SEMI-AUTOMATIC  
MILL ENGRAVING MACHINE**  
UNCLASSIFIED

**THE MS SEMIAUTOMATIC MILL ENGRAVING MACHINE**

is intended for engraving patterns into copper or steel rollers used in printing machines transferring coloured patterns on to textile fabrics. The purposeful design of the machine (Fig. 1) is the result of thorough study, and of ample experience with the original nonautomatic machines.



**THE MACHINE CONSISTS OF THE FOLLOWING MAIN PARTS:**

**THE BED:** This is of exceptionally rugged construction, to exclude deflection, and is made of high grade cast steel. The guide surfaces for the slide, and the bearings of the printing roller are precision ground to a very close tolerance, i.e. to several hundred parts of a millimeter, and are inspected for it along the whole length.

**THE HEAD-STOCK** is completely enclosed and provided with precision milled gear wheels immersed in oil. The wheel shafts run in ball bearings or roller bearings. By setting the four transmission gearing in various ways the three-speed driving motor yields 12 different speeds in both directions of rotation. The steel iron apron of the outer gear wheels protects the operator from danger of accidents.

**THE GUIDE SPINDLE**, made of special steel and with a precision cut thread, is borne by journal and thrust bearings. It is empty, clean, and at the same time economically lubricated. At the gearing and the spindle (Fig. 4) is extended to enable a separate drive for oblique engraving to be fixed to it.

**THE SLIDE** moves along the bed on eight precision ground surfaces. It is adjustable by the lever on the guide spindle and by the index dial (Fig. 2). The index dial, which is provided with two indicators, is accommodated at the extreme end of the machine.

**THE PRESSING-ON DEVICE** of the engraving mill which consists of a sturdy lever mechanism, can be set to the required position by means of a hand wheel, from the working position of the operative. The pressing head of the mill is provided with a hand operated regulator to ensure full length contact of the mill (Fig. 6). Pressure exertion or relieving of the pressure is actuated by an electromotor over a worm gearing. The pressing-on device is controlled by means of a hand operated lever and by a change-over switch, accommodated on the front wall of the slide. The amount of pressure is adjusted by adding or removing weights with which the bottom main lever is loaded.

**THE BEARINGS** of the printed roller rest on the ground guide rails of the bed and are crosswise adjustable into their correct position. The bearing on the right hand side of the machine can be moved longitudinally into the position required.

**THE AUTOMATIC BUMPING DEVICE** (see Fig. 3) by which pattern is engraved by an oscillating motion consists of a system of levers and of a crank mechanism. The required number of oscillations, i.e. bumpings, can be set in advance on the counting and stop device (Fig. 4) which is equipped with a bell signal announcing the last given bump.

A **SHOE BRAKE** ensures that the engraved roller can be immediately stopped in case of need. The **DEVICE FOR OBLIQUE, SPIRAL OR CROSS-WISE ENGRAVING** is removable and when it is to be used it is to the guide spindle extension and to the driving shaft extension of the head-stock.

**THE GUIDED MILL DRIVE** as shown in Fig. 1 is derived from the shaft which bears the engraved printing roller, and the motion is transmitted over change gear wheels. Together with the extended shilling rod this makes it possible to carry out adjustments ensuring accurate joining up of the pattern repeats on the printing roller.

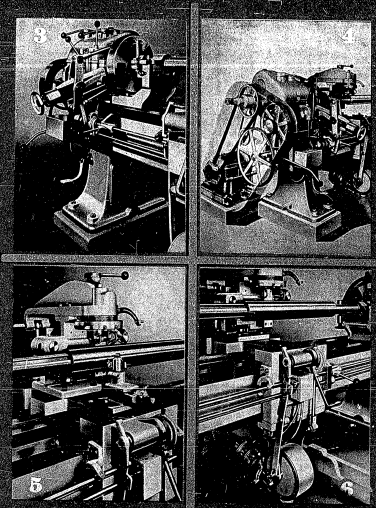
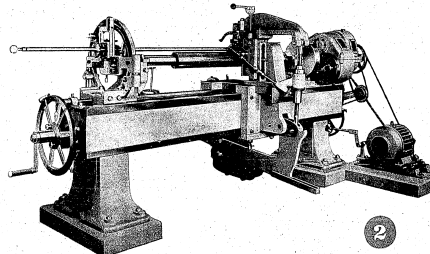
**POWER TRANSMISSION** from the three speed motor (Fig. 2) is effected by means of a wax-ball. The change-over switch is operated by a shifting rod which is at the front of the bed and which bears a movable lever enabling the operator to change the speeds and to reverse the motor from any working position.

**THE RAPID FEED** of the engraving mill, controlled by a handy lever, eliminates lengthy shifting of the mill into the required position. The machine is highly efficient and easy and simple to operate as almost no physical exertion is required, many of the firing operations having been made fully automatic.

**THE ADVANTAGES OF THE MACHINE ARE:**

**THE GUIDED DRIVE** of the engraving mill which has superseded the old lengthy pinion aided distributing of the pattern over the printing roller circumference. The new way of working enables the pattern to be transferred accurately joined up, even on rollers of small circumference. To allow for various heights of pattern and various diameters of the printing rollers and the mill, a set of change gear wheels is supplied with the drive.

**THE AUTOMATIC DEVICE FOR IMPRESSING THE PATTERN BY BUMPING**, i.e. oscillating motion, replaces the helper required in the old engraving method; in fact, it eliminates the heaviest manual work while achieving a high grade of precision, and quick results. The counting and stop device ensures even depth of the engraved pattern.

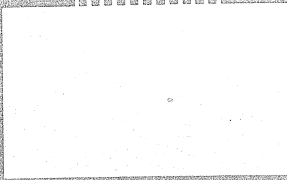


dans vos ateliers de tissage, dependent:

La productivite plus grande du travail.  
L'amplification de la qualite des produits.  
L'augmentation de vos profits.

Les machines KOYO sont les plus modernes, les plus fiables et les plus rapides du monde. Elles sont adaptees a toutes les conditions de travail et a tous les types de tissus.

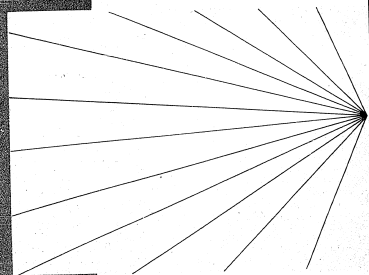
- 1 **BORNIER CROISE 2**  
à haut rendement d'une manipulation tres aisée.
- 2 **OURDIEUSES À PORT-BORNIER**  
Sont les plus modernes et les plus rapides dans les ateliers de tissage et les usines modernes.
- 3 **CANETIÈRES AUTOMATIQUES FPE 3051**  
de dimensions reduites et d'un rendement élevé.
- 4 **METTES AUTOMATIQUES F 46**  
d'une construction moderne et utilisee dans toutes les parties du monde, pour le tissage de tous types de tissus.
- 5 **METTES AUTOMATIQUES EX**  
universellement connues, offrent l'avantage d'un emploi universel.
- 6 **BATISSES**  
d'un systeme moderne, à marche double, très en vogue chez les clients.
- 7 **MACHINES SACQUARD**  
d'une construction precise, existant aux conditions les plus sévères.



EQUIPEMENT POUR ATELIERS DE TISSAGE

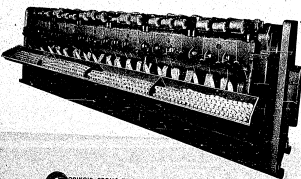


De la qualite des machines que vous installerez

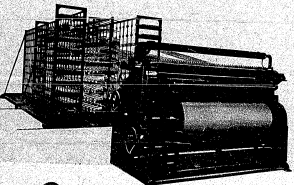


PRAHA - TCHÉCOSLOVAQUIE

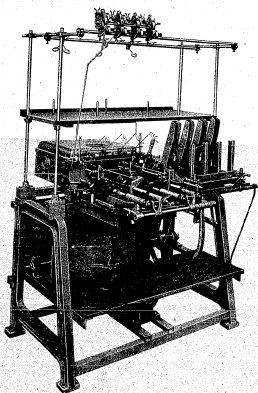




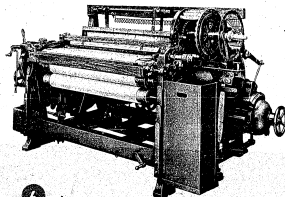
**1** **COMBES TREIZIÈME**  
Cinq rangées de 24, 24 et 48 dents. Le nettoyage s'effectue de la droite vers la gauche et de l'arrière vers l'avant. Les dents sont réglées en hauteur par une vis de réglage latérale.



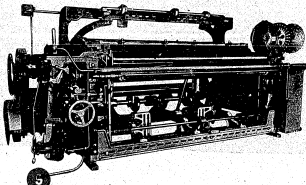
**2** **OUVERTURE À MARCHE RAPIDE, AVEC CANTRE**  
Vitesse régulière, freinage régulier. Mécanisme de freinage à commande électromagnétique. Système automatique de cylindre d'entraînement. Le réglage de la vitesse est indépendant de la commande de marche.



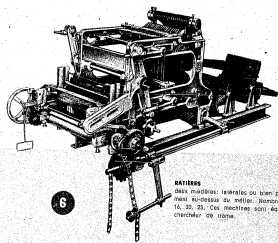
**3** **CANTRE AUTOMATIQUE TYPE 301**  
Machine de haute précision, pour cardage de toutes les sortes de fil des types cardés et non cardés, utilisés sur canettes, utilisés sur les métiers automatiques.



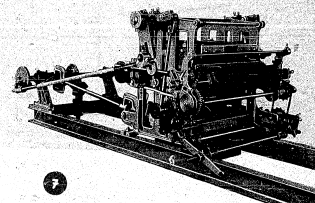
**4** **AL 1 COTON**  
Moteur à huile d'un haut rendement, avec mouvement de chasse-motivé sans choc. Changement automatique des canettes. Construction simple, robuste et facile à entretenir. Réglage précis du nombre de canettes par minute. Pour le filage de bases légères et dentelées, une canette peut dépasser de 50 mètres et même denteler.



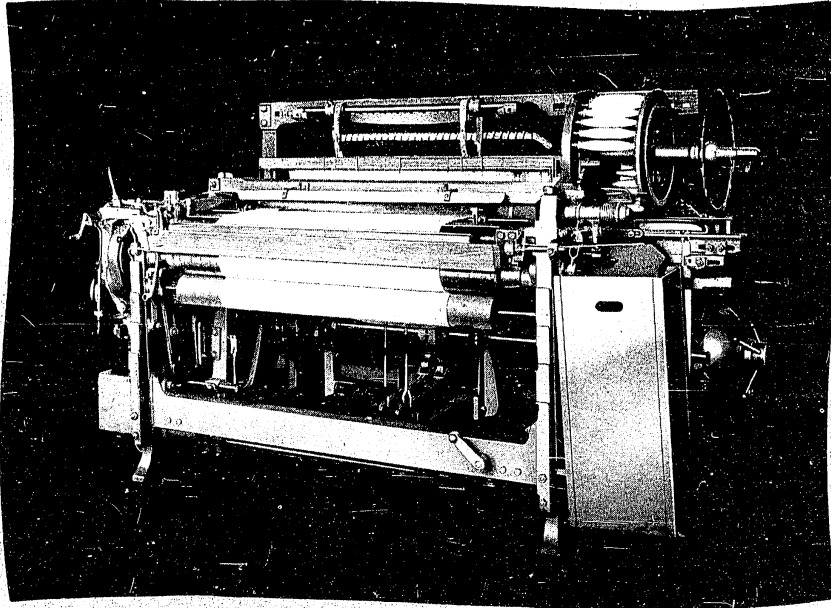
**5** **MÉTIER AUTOMATIQUE ES**  
Métier moderne, d'un haut rendement et très régulier par son entraînement. Construction précise, très équilibrée pour l'effet de la chaîne et du jacquard. Échange automatique des canettes, commande mécanique, liaison électrique de filage.



**6** **BATTEUSE**  
Belle machine, parfaite de ligne pour donner l'aspect au filage. Nombre de canettes de 24, 24 et 24. Ces machines sont équipées d'un chariot de filage.



**7** **MÉTIER JACQUARD**  
Métier moderne à double effet pour tissage direct devant ou derrière de gros et finement.



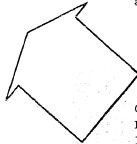
*Automatic Looms*

**KOVO**

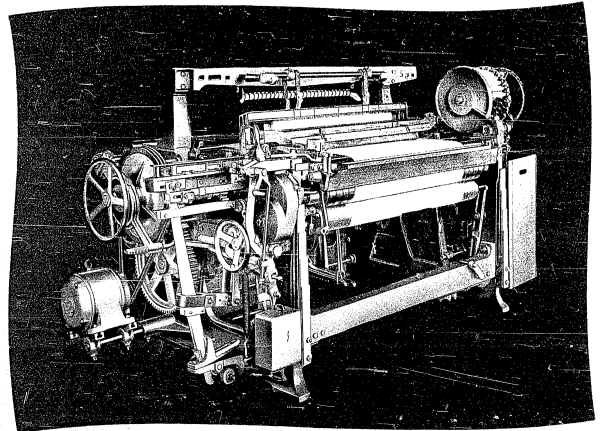




We are submitting herewith our leaflet on the fully automatic cotton loom F 44 which should acquaint you with the advantages of the loom, with its simple design, and with the resulting easy operation. The loom F 44 has been exported to countries all over the world for many years and has found universal approval due to its reliability and high output;



Great Britain  
Belgium  
France  
Netherlands  
Denmark  
Sweden  
Norway  
Finland  
Austria  
U. S. S. R.  
Poland  
Bulgaria  
Rumania  
Portugal  
Italy  
Greece  
Egypt  
Kamerun  
Belgian Congo  
Union of South Africa  
Syria  
Lebanon  
Pakistan  
India  
China  
Indonesia  
Canada  
Mexico  
Brazil  
Argentina  
Uruguay



**AUTOMATIC COTTON LOOMS F 44**

meet the requirements of all modern automatic weaving mills due to their following features:

- Simple, yet purposeful design.
- Individual control mechanisms eliminate damage to the machine and ensure absolutely reliable operation.
- The machine runs smoothly as the main shafts are carried by ball bearings.
- Simple and quick setting.
- Every lubricating spot is easily accessible.
- Best quality material and precise machining safeguard long life of the machine.
- The low structure of the machine facilitates the surveying of the woven fabric and of all mechanisms, as there is good access of light.

All these properties of our automatic cotton loom bring about:

- High quality of woven goods.
- Substantially increased productivity at full utilization of maximum effective output of the loom.
- Reduced operating costs, as the machine may be operated by unskilled labour. In our experience 1 trained weaver can attend to as many as 50 looms under normal working conditions and when weaving medium quality goods.
- Minimum maintenance costs due to considerably long wear of the individual component parts.

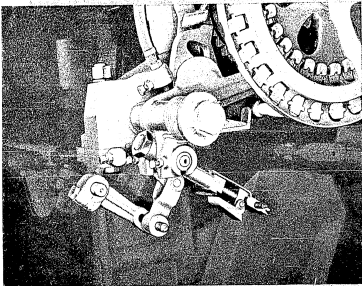
The individual parts of all the three types of looms are interchangeable, this being one more money saving factor, because it is not necessary to keep 3 different stocks of spares.

These looms have the following sizes:

- Type A 44 — working width 103 cm
- Type F 44 — working width 113 cm
- Type E 44 — working width 135 cm

**PIRN BATTERY**

The looms are equipped with automatic pirn changing mechanisms. The pirn battery holds 24 pirns. When fully charged the battery drum is turned into position by a pawl and locked until the next pirn exchange takes place. The standard setting

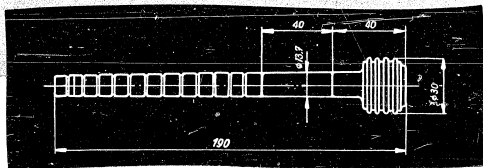
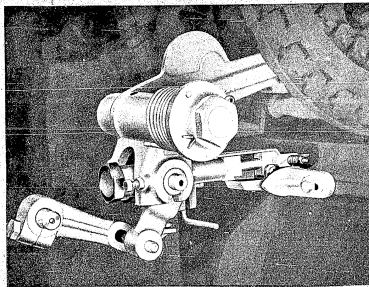


length of 100 mm a ring head diameter of 30 mm, but the pirn battery may be also adjusted for other pirn lengths from 163 mm upward.

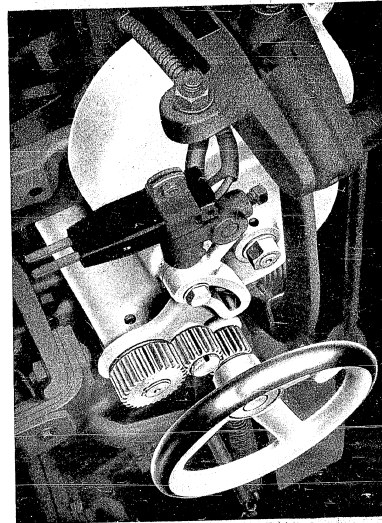
**The TELESCOPIC LEVER** is the very heart of our automatic loom. It saves you money, it does not deprive you of profits, it draws the operator's attention to a faulty setting of the loom and increases the quality of woven goods, because it does not allow faulty pirn supply into shuttle which would result in the tearing of the whole fabric by the projecting pirn end or in the breaking of the shuttle and in damage to the automatic pirn changing mechanism — defects

often occurring with looms of other makes.

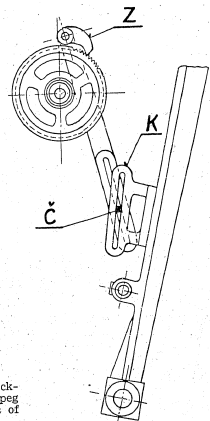
When the electric feeler detects the necessity of pirn replacement, the telescopic lever takes up horizontal position under the battery and its end enters the shuttle opening giving thus an impulse for the replacement. The shears at the end of the lever cut off and firmly hold the remaining weft until the time when this is held by the temple. If the shuttle is not in the correct position, i. e. the safety lever does not enter the shuttle opening, but strikes against the shuttle wall, the feeler does not give an impulse for the pirn changing.



**TAKE-UP MOTION**



The take-up motion may be set for 10—40 weft ends to 1 centimetre according to the required number of ends. When setting 18—40 weft ends to 1 centimetre a ratchet wheel is used having as many teeth as is the required number of ends to 1 centimetre. The pawl (Z) moves by one tooth.

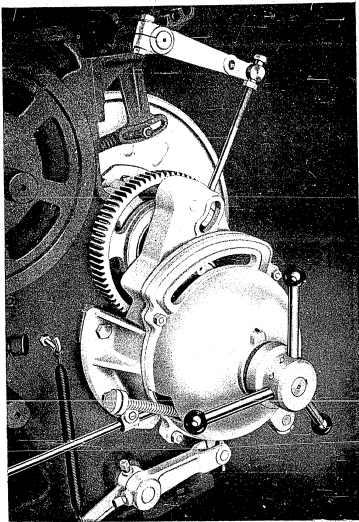


For densities of 10—17 weft ends per 1 centimetre the racking of the take-up motion pawl (Z) is set by shifting the peg (C) in the slot (K) according to the Table of Numbers of Ends (Densities).

| Number of teeth of the exchangeable wheel | 18                                  | 19 | 20   | 21 | 22   | 23 | 24   | 25 | 26   | 27 | 28   | 29 |      |
|---|-------------------------------------|----|------|----|------|----|------|----|------|----|------|----|------|
|   | Density number of weft ends to 1 cm |    |      |    |      |    |      |    |      |    |      |    |      |
| The pawl racks by                         | 1 tooth                             | 18 | 19   | 20 | 21   | 22 | 23   | 24 | 25   | 26 | 27   | 28 | 29   |
|   | 2 teeth                             | 10 | 16,5 | 11 | 11,5 | 12 | 12,5 | 13 | 13,5 | 14 | 14,5 | 15 | 15,5 |
|   | 3 teeth                             | 10 | 16,5 | 11 | 11,5 | 12 | 12,5 | 13 | 13,5 | 14 | 14,5 | 15 | 15,5 |

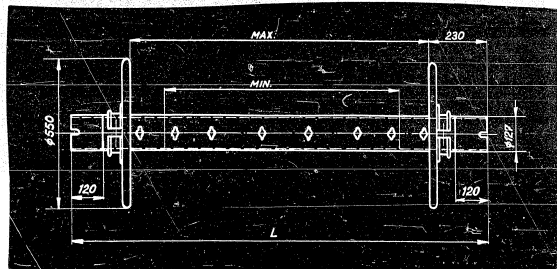
| Number of teeth of the exchangeable wheel | 30                                  | 31 | 32   | 33   | 34   | 35   | 36   | 37 | 38   | 39   | 40   |      |
|---|-------------------------------------|----|------|------|------|------|------|----|------|------|------|------|
|   | Density number of weft ends to 1 cm |    |      |      |      |      |      |    |      |      |      |      |
| The pawl racks by                         | 1 tooth                             | 30 | 31   | 32   | 33   | 34   | 35   | 36 | 37   | 38   | 39   | 40   |
|   | 2 teeth                             | 15 | 15,5 | 16   | 16,5 | 17   | 17,5 | 18 | 18,5 | 19   | 19,5 | 20   |
|   | 3 teeth                             | 10 | 16,5 | 11,6 | 11   | 11,5 | 11,6 | 12 | 12,3 | 12,6 | 13   | 13,3 |

**LET-OFF MOTION**



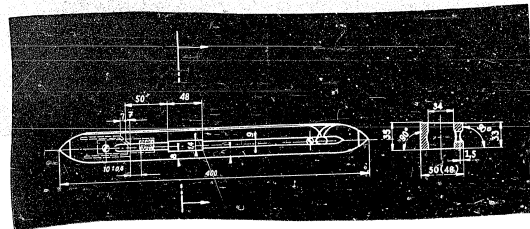
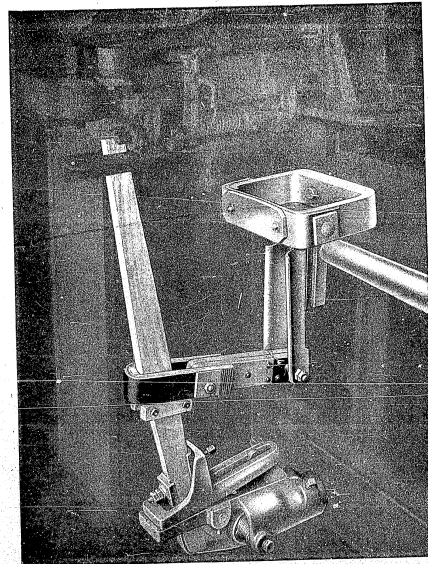
The warp tension is controlled by a let-off motion situated in the casing at the right side of the loom. The oscillations of the back rest are transmitted by the tie-rod T to the let-off mechanism which equalizes the tension of the warp threads by releasing the warp. The warp is released and the warp beam turned in both directions by a clutch which is disengaged by any of the three arms and engaged again after the gearing of the let-off motion has turned a little.

|      |         |      |      |
|------|---------|------|------|
| Type | A 44    | -L = | 1505 |
|      | maximum |      | 1045 |
|      | minimum |      | 790  |
| F 44 | -L =    | 1605 |      |
|      |         | 1145 |      |
| E 44 | -L =    | 1825 |      |
|      |         | 1365 |      |

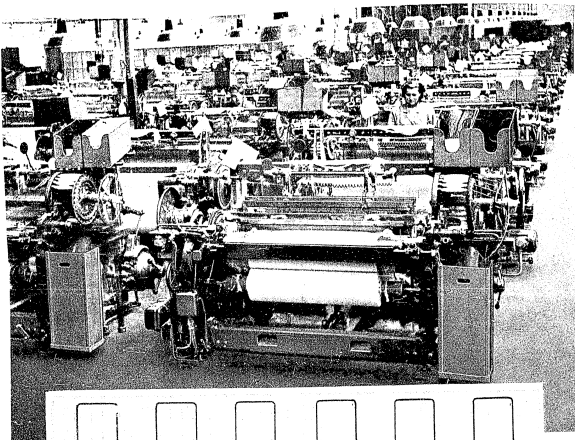


**PICKING MECHANISM**

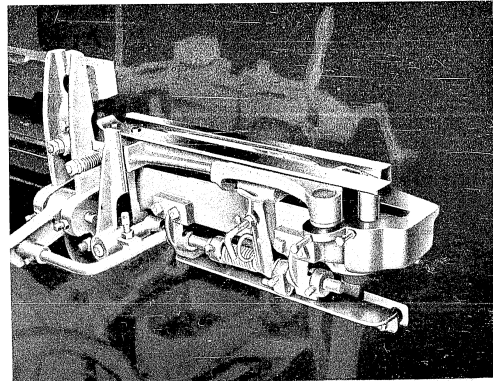
The equipment for shuttle picking is of simple rocker design. The picking arm is provided with a safety insertion so that should the tension spring break, the arm cannot be thrown up and damage the pick battery mechanism.



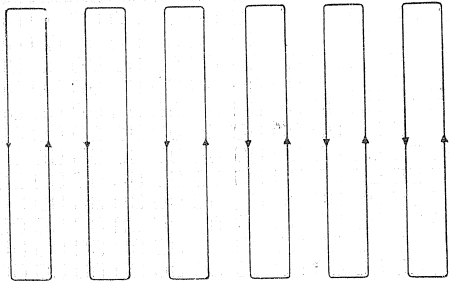
The accurate and clever design of the loom facilitates attendance, so that it is by no means exceptional when 50 looms are operated by one woman.



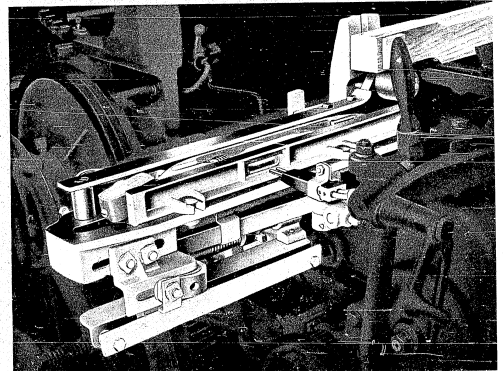
### SHUTTLE BOXES



During the picking operation the shuttle is braked in the shuttle boxes by braking arms and braking fingers. The braking arms as well as the braking fingers are covered with leather which increase the friction.



- WEAVERS
- MACHINE SETTERS
- WOMEN CHARGING THE BATTERY
- WOMEN SEPARATING THE WEFT
- WOMEN DRAWING-IN THE WARP
- LOOM CLEANING
- LUBRICATING THE LOOM
- FOREMAN

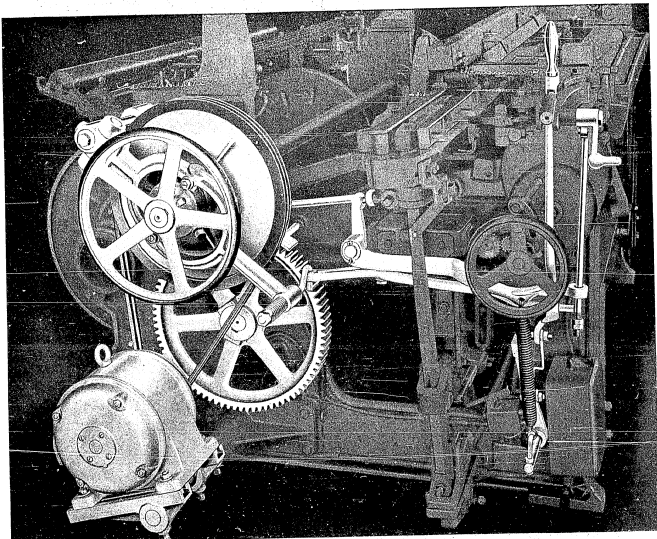


In the front shuttle well there is an opening through which the electric feeler checks the weft quantity on the pirn. When the weft is running out, the contacts touch the sheet iron collar of the pirn and by means of an electric magnet an impulse is given for the pirn changing.

and auxiliary labour according to the individual needs of the mill.

### STARTING AND DRIVING THE LOOM

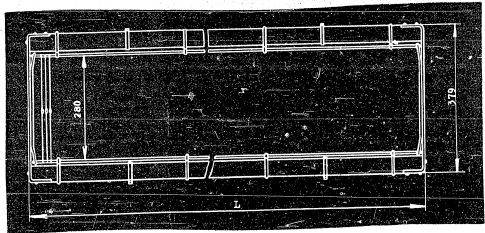
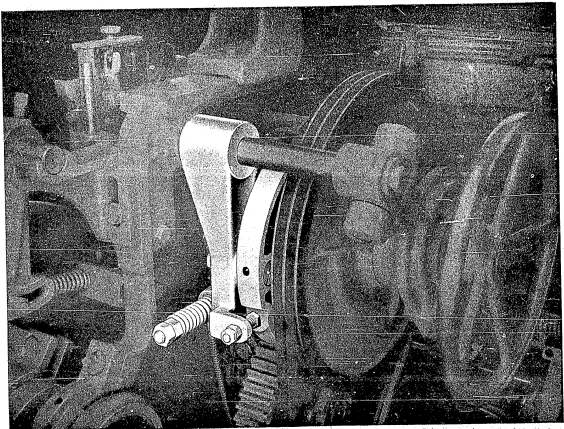
The starting lever is situated at the left side of the loom. Its motion is transmitted by a lever to a sleeve which actuates the clutch disc. The clutch disc is driven from the motor by a Vee-belt. When the loom is started this cork-covered disc is pressed by the sleeve firmly to the crankshaft disc, but when rotating the loom by hand it is necessary



to relieve the disc by means of the pawl. When the loom starts running, the pawl returns automatically back.

### BRAKE

The brake is situated on the supporting spindle of the starting lever sleeve. Whenever the machine is stopped, the brake bears effectively against the brake disc which is fixed to the crankshaft. Higher or lower friction effect is obtained by adjusting the spring tension by set nuts.

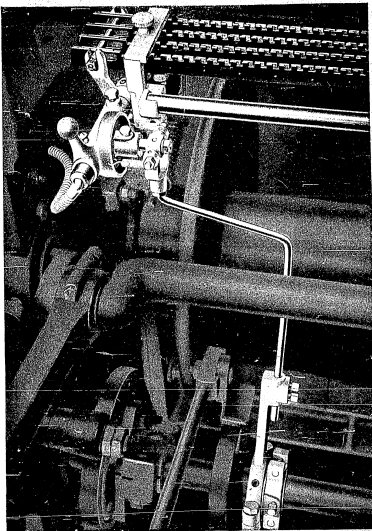


A 44 - L = 1380

F 44 - L = 1180

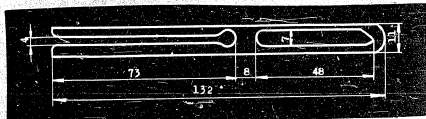
E 44 - L = 1400

**WARP STOP MOTION**

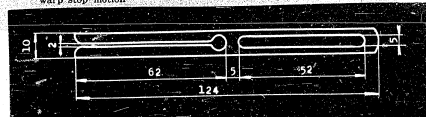


Either an electric or an electro-mechanical warp stop motion may be fitted to the machine according to order. The electro-mechanical stop motion has all the advantages of a mechanical stop motion, combined with the simplicity of electrical transmission. This latest arrangement has proved very satisfactory and is supplied with most machines, as there is no chance of the warp waste catching fire. The electro-mechanical warp stop motion is driven from the eccentric via the disengaging disc to the warp dropper bar. When the warp thread breaks, the warp dropper stops the motion of the warp dropper bar, the disc is deflected, the electric circuit closes and the loom stops.

When ordering either the electrical or the electro-mechanical warp stop motion indicate always exactly the voltage of the single-phase lighting current for the transformer.

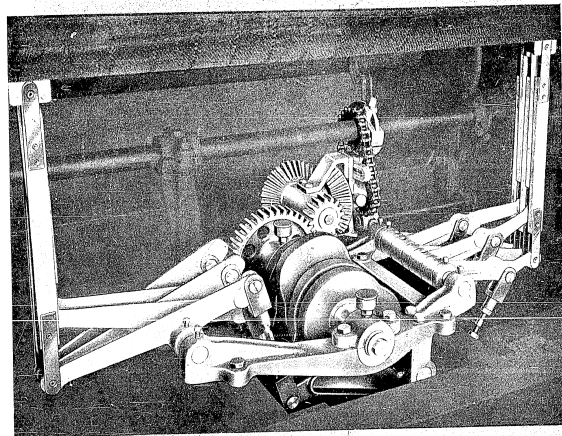


Warp dropper for electric warp stop motion  
Warp dropper for electro-mechanical and mechanical warp stop motion



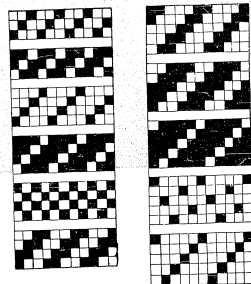
**FIVE-SHAFT SHEDDING MOTION**

As a special accessory we supply an equipment for weaving 3 shaft, 4 shaft, 5 shaft weaves, or 2 shaft and 4 shaft linens. The lift and the motion of this equipment are guided, so that any reverse motion of the shafts is eliminated. The shafts are controlled by tie-rods with special chucks so that the setting of the picking motion remains unchanged for the whole time of weaving. The grooved eccenters are machined on special machines so that they have an absolutely precise shape. They are delivered on order for these weaves.



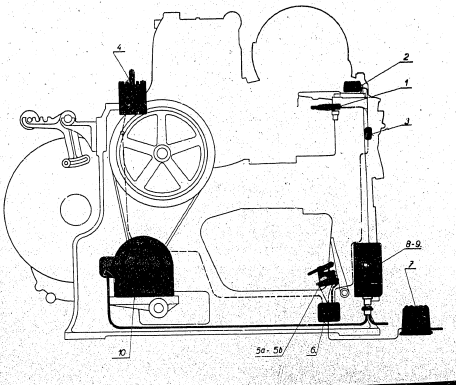
A selvage weave attachment is delivered for this equipment on special order. The individual weave repeats may be combined.

When ordering kindly state for instance: eccenters for 2:2 weave and selvage weave attachment.



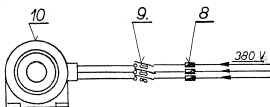
### ELECTRICAL INSTALLATION

The electrical installation of the F 44 loom is exceptionally simple as shown on the enclosed picture and diagram. The low voltage for the electric stop motion is 12 V and that for the electric magnet is 40 V.



#### LOW VOLTAGE WIRING DIAGRAM

1. Weft feeler
2. Electromagnet of the weft feeler
3. Switchbox
4. Warp stop motion
- 5a. Electromagnet of the warp stop motion
- 5b. Low voltage circuit breaker
6. Terminal box
7. Transformer or transformer unit of 40 and 12 V secondary tension
8. Fuses 10 A
9. Three-phase circuit breaker
10. Electric motor



### TECHNICAL DATA

| Type | Working width | Reed width | Minim. speed RPM | Maxim. speed RPM | Recom. speed RPM | Input   | Max. tension of warp threads | Machine weight |
|------|---------------|------------|------------------|------------------|------------------|---------|------------------------------|----------------|
| A 44 | 103 cm        | 110 cm     | 170              | 200              | 185              | 0,66 kW | 220 kg                       | 1200 kg        |
| F 44 | 113 cm        | 120 cm     | 170              | 200              | 180              | 0,75 kW | 220 kg                       | 1230 kg        |
| E 44 | 135 cm        | 142 cm     | 170              | 185              | 175              | 0,8 kW  | 175 kg                       | 1280 kg        |

Speed when using dobby . . . . . 170 RPM  
 Speed when using eccentric equipment . . . . . 180 RPM max.

#### LOOM DIMENSIONS

| Type | Width   | Height  | Depth   | Dimensions of machine in seaworthy packing | Distance between foundation bolts |
|------|---------|---------|---------|--|-----------------------------------|
| A 44 | 2400 mm | 1250 mm | 1500 mm | 1640×1200×2500                             | 1452×1070                         |
| F 44 | 2500 mm | 1250 mm | 1500 mm | 1640×1200×2600                             | 1552×1070                         |
| E 44 | 2720 mm | 1250 mm | 1500 mm | 1640×1200×2820                             | 1772×1070                         |

#### Standard accessories:

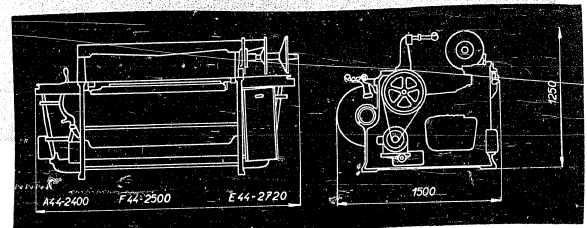
- warp beam
- cloth roller
- electric warp stop motion
- temple shears
- set of exchangeable wheels
- 2-shaft shedding motion

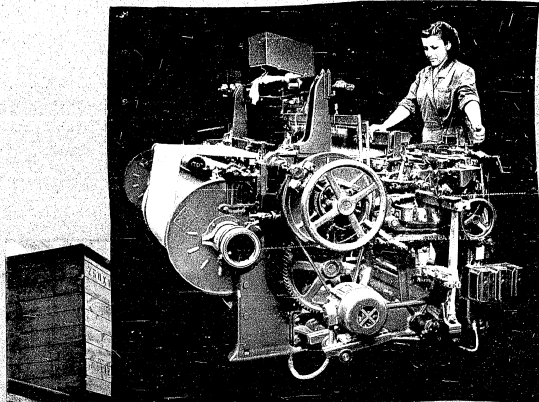
#### Special accessories (supplied on order):

- shuttle
- temple rollers
- spare warp beam
- spare cloth roller
- weft counter
- transformer
- 5-shaft eccentric equipment
- selvedge weave equipment
- warp droppers
- pins

As our machines are being constantly improved, the data of the leaflet are not binding in detail.

When ordering state the voltage of the power feed for the motors and the transformer!





**KOVO**

PRAHA - CZECHOSLOVAKIA

COK 811207 a - 9401

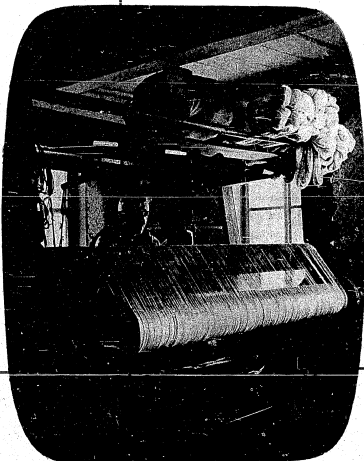
Printed in Czechoslovakia

**ES** AUTOMATIC LOOM

THE LOOM WITH A THOUSAND POSSIBILITIES



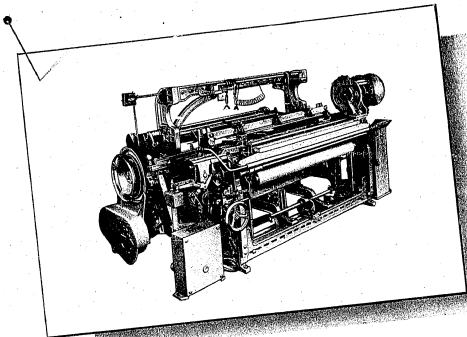




SEVERAL INTERESTING PARTICULARS FROM THE HISTORY OF THE ES LOOM

**I**ts native place is a picturesque but a very infertile mountain region. When Nature distributed her gifts she really behaved as a stepmother to this region and its inhabitants were in consequence induced to look for another means of earning their living. They became weavers, but the work was not easy. Distress and stern struggles for their existence were prevalent here. However, their unyielding, hardworking character and skilfulness paid in the end. The efforts of many generations to bring about automatization and relief in their hard work have been successfully proved by the designing of a fully automatic loom. It therefore goes without saying that the ES Loom embodies all the long, valuable years of experience of the local weavers and the results of their having been faced with heavy competition. More than fifty years have already passed since the manufacture of the ES Loom was started. For this reason the producers are able to place before their customers a loom which exactly meets their most exacting requirements.





## INTRODUCTION OF THE ES LOOM

This concerns the universal Loom, from the basic construction of which a wide range of 1,100 variations may be achieved and this figure speaks for itself.

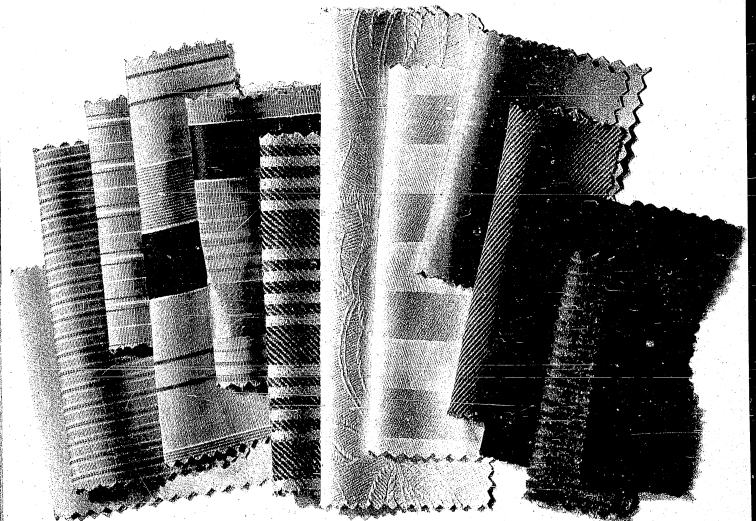
This loom is manufactured in three different basic executions, namely the type ES I for light-weight fabric, the type ES II for medium-heavy fabric and the type ES III for heavy-weight fabric. All these three executions are variations of the same loom, to the standard construction of which only several parts are modified as necessary. Upon special adjustment, this loom may be converted to a Turkish towel loom or to a loom for the weaving of cotton coloured goods. Besides the standard width, manufactured as stated before, these looms may be supplied in any desired width, if required. Rich experience ensures that the individual functioning parts are perfectly designed with regard to textile technology and the highest possible degree of utility of the machine is thereby achieved.

To mention further advantages and features of these machines, we wish to stress the following:

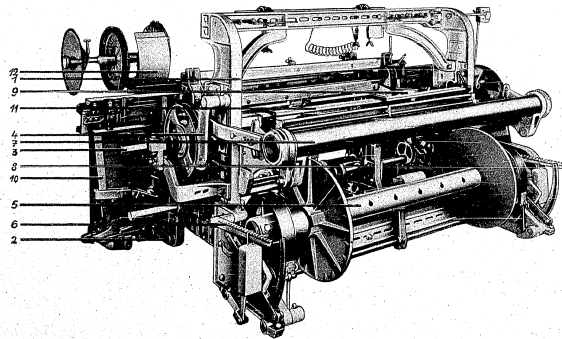
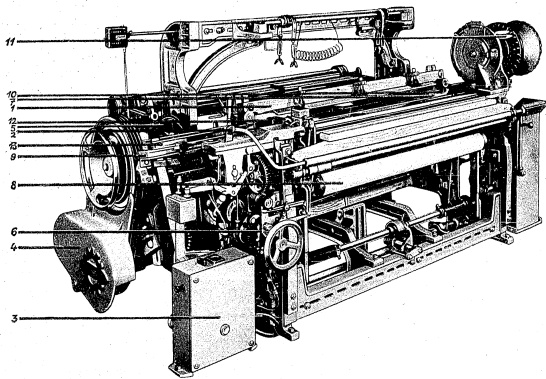
- 1 The long working ability of the ES Loom when compared with other makes, which is due to its perfectly designed and robust construction.
- 2 The ES Loom is provided with a countershaft and V-belts which assist in the achievement of the desired number of revolutions of the crankshaft with respect to the kind of the yarn used.
- 3 One female operator may attend on an average 20-40 looms. The exact number is dependent on the reed-space of the loom and on the kind of fabric produced.
- 4 The loom is perfectly balanced so that it works without any jolting.
- 5 The purposeful and simple design of the loom enables easy adjustment and attendance of the machine. All the parts are easily accessible.
- 6 The parts are manufactured according to the tolerance system, thus ensuring their easy replacement.
- 7 The loom is provided with a tested drum pirn magazine with a ratchet safety wheel.
- 8 The feeler which puts the pirn replacing mechanism into operation finishes the replacement prior to the weft being completely woven off, thus eliminating faults in the fabric.

- 9 The temple cutter and special scissors on the lever controlling the shuttle position reliably cut off and remove the weft thread when the pirns are replaced and thus prevent weaving in of the weft ends.
  - 10 A simply designed automatic warp let-off motion accurately regulates the tensioning of the warp.
- The ES Loom, due to its versatile applicability, is the best ally in your competitive combat.

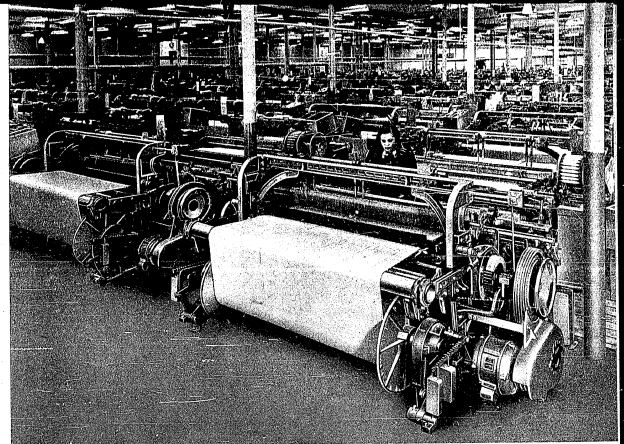
Be the reason for the sale crisis of textiles in various parts of the world as it may, there is one decisive point; this situation can be solved with success only by improvements in quality with simultaneous price reductions. Only thus can you get the buyers interested in your products and prevail over competition. The more difficult the market situation of textile products, the greater are the requirements for their quality, assortment and the machines themselves. The existing method of production may not always prove sufficient and it is therefore advisable to aim at a developed production system. It is necessary to attain the highest possible productivity at the minimum production costs, it is desirable to automatize the weaving mills and to equip them with the most suitable machines. At the same time it is necessary to bear in mind that nowadays a close specialization in production does not allow progress and it is necessary to install machines of versatile applicability, thus ensuring quick operative changes and a speedy reorganization of production, if necessary. The ES Loom complies with these requirements in an excellent manner. If properly adjusted, it is possible to manufacture the first-class quality cotton, flax and rayon fabrics of first-class quality ranging from the light-weight kinds to a technical fabric. By means of an inside treading motion it is possible to weave 2-, 3-, 4- and 5-shaft binding. This loom is further suitable for the use of dobbies for multishaft weaves and jacquard machines for rich jacquard patterns.



- |                                     |                          |                     |
|-------------------------------------|--------------------------|---------------------|
| 1 Clay cap                          | 6 Goods roller           | 10 Shuttle          |
| 2 Disengaging mechanism             | 7 Temples                | 11 Firm             |
| 3 Mounting of electric installation | 8 Winding-on arrangement | 12 Weft stop motion |
| 4 Drive of the loom                 | 9 Slay                   | 13 Shuttle box      |
| 5 Band brake                        |                          |                     |

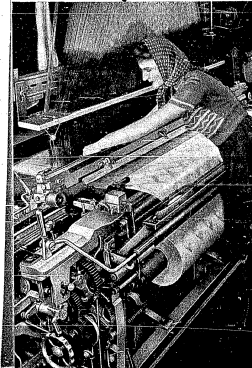


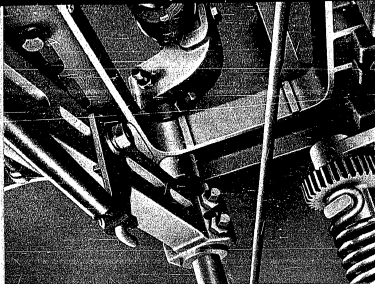
- |                           |                                |                      |
|---------------------------|--------------------------------|----------------------|
| 1 Frame of the loom       | 5 Warp beam                    | 9 Connecting rod     |
| 2 Mounting of the subslay | 6 Negative warp let-off motion | 10 Picking motion    |
| 3 Crankshaft              | 7 Yarn rest                    | 11 Warp stop motion  |
| 4 Jaw brakes              | 8 Shedding motion              | 12 Drum pin magazine |



### BASIC EXECUTION OF THE ES LOOM FOR THE PRODUCTION OF COTTON FABRIC

When manufacturing the cotton ES Looms we concentrated on the types ES I and ES II in order to respect the main interests of our customers. The type ES I is a light loom in general, the chief characteristic of which is a lighter construction of the frame and all other mechanisms, thus resulting in a greater number of picks. This loom is suitable for weaving cotton fabric weighing approx. 150—300 grammes per one square metre — if you deal with looms with a reed-space up to 145 cm — and 150—250 grammes per one square metre if wider looms are concerned. The type ES II is destined for medium and medium-heavy fabric weighing 300—450 grammes per one square metre in the case of looms with a reed-space of 145 cm and 250—350 grammes per one square metre for wider looms. This type of loom is generally more powerful, heavier and the number of picks is reduced approx. by 10 per cent when compared with the ES I Loom. The ES I Loom is required mostly for a reed-space of 115 cm, the ES II Loom for reed-spaces of 135, 175, 195 and 225 cm. For a survey of the executions of individual parts of this basic ES Loom see the following pages.





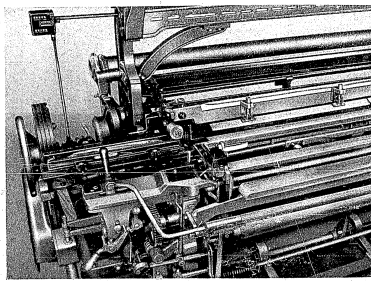
**DESCRIPTION OF THE INDIVIDUAL MECHANISMS OF THE COTTON ES LOOM**

**FRAMEWORK** is standard, only the reinforcement for various widths and types of looms are varied. The heavier ES II type Loom has the framework of the same frame more reinforced by a greater number of supports and by a rear cross girder which is excluded on the ES I Loom.

**MOUNTING** of subslay is just a typical difference between the ES I Loom and the ES II. The subslay of the ES I Loom is mounted in the front bearing opening in the side frame. A rear opening is used for the same purpose on the ES II Loom. (See picture No. 1.) This ensures perfect weaving of fabric with a higher number of picks or fabrics where the desired number of picks is normally achieved only with difficulty.

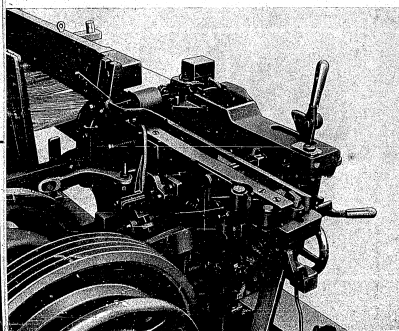
**SLAY CAP** of the ES II Loom is of a much more heavy construction when compared with that of the ES I Loom which is made of wood. As a result, the blowing power of the slay is increased. On this slay cap there is mounted a shuttle trap. The slay cap on wider looms is fitted with a device for hand operation of the knock-off fingers by means of a round shaped belt on its entire length.

**SLAY** is designed to carry alternatively a fast soldered or pitch-bonded reed. It is made of steel section with shuttle race of bonded wood. (See picture No. 2.)



**SHUTTLE BOX** has a fast front wall and a springing rear one, thus preventing any possible damage of the shuttle. The rear wall is further fitted with a shuttle flap which carries out the movement of knock-off finger, and with a leather covered braking flap used for braking the shuttle. (See picture No. 3.)

**SHAFTS** have diameters of 42 cm or 45 cm, depending on the width and the type of the loom. They are mounted in plain bearings with ring lubrication. The crankshaft on the right side of the loom is lengthened for alternative fitting of the dobby drive with a vertical shaft, or the jacquard machine with a vertical shaft or a link chain.

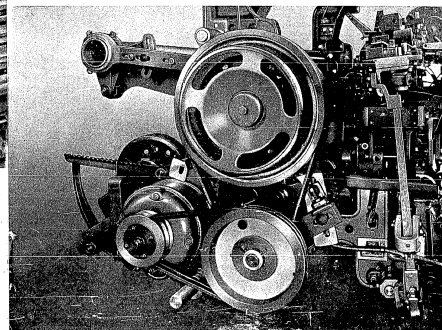


**DISENGAGING** is carried out by a lever which is always placed on the left-hand side of the loom and connected with a pull rod (disengaging rod) on the whole width of the loom (if widths of looms larger than 135 cm are concerned). This disengaging device operates the electric installation either by means of pull rods or push-buttons. The reverse motion and individual release of the brake is carried out by means of special levers. (See picture No. 4.)

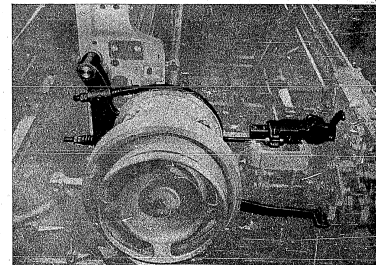
**ELECTRIC INSTALLATION** is mounted in a closed dust-proof cast-iron box. It is designed for the possibility of a reverse motion of the loom and electric motor. The box for the electric installation is universally designed to suit various working voltages of 120, 220, 380, 415 and 550 V with an individual transformer rated for 12 and 40 V, allowing at the same time connection with the electrical warp stop motion and electrical weft feeder. The switch placed on the box serves as a safety device to exclude any involuntary start of the loom.

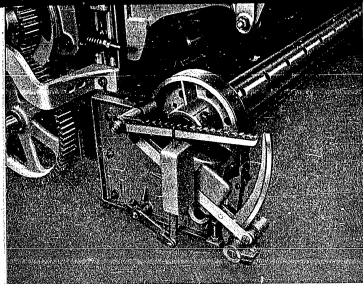


**DRIVE** is always situated on the left side of the machine and is carried out by an individual electric motor and slipping friction clutch. The drive from the electric motor is by means of V-belts. (See picture No. 5.) It is, at the same time, possible to insert a reduction gear with a built-up motor pulley in order to reduce the revolutions of the loom, if desired. The electric motor with an increased engaging moment is designed specially for weaving purposes and is enclosed in a dust-proof cover. The required power of the electric motor depends on the type of the loom. If not stated otherwise, the loom is equipped with an electric motor rated for 380/220 V, 50 cycles.



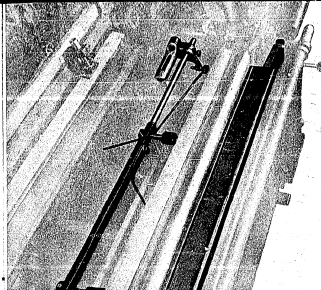
**BRAKING** is carried out either by jaw-type brakes in the case of engaging the knock-off fingers or by a combined band brake in the case of stopping the machine. (See picture No. 6.)





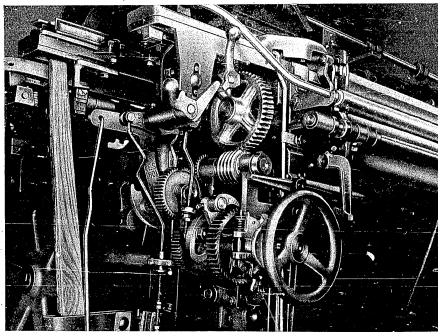
**WARP BEAM** is a seamless machined tube of 110 mm dia. and is provided with openings for fixing on the bundle of warp threads. The flanges are smoothly machined with a dia. 550 mm or 600 mm. Mounting is carried out according to the regulator used.

**WARP LET-OFF** with a worm gearing is operated by a ratchet and multiple pawl. The motion of the pawls is influenced by the negative part of the regulator used.



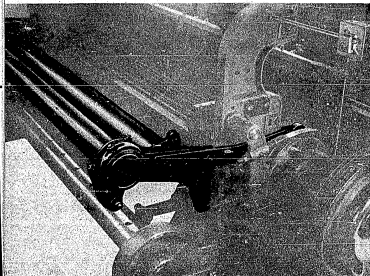
**NEGATIVE WARP LET-OFF** is principally a brake which automatically maintains a constant warp tension during a reduction of diameter of the warp beam. (See picture No. 7.)

**TAKE-UP MOTION.** The looms may be equipped either with spur wheel or worm wheel driven take-up motions. Both types of take-up motions are equipped with changeable gear wheels in order to achieve the desired number of picks. As far as the use of these take-up motions for individual types of ES Looms is concerned, the decisive point here remains the purpose which these looms have to comply with. (See picture No. 8.)



**YARN REST.** Using the worm wheel driven warp let-off, it is possible to equip the loom with a single yarn rest fitted with springs for light-weight fabric, or with a heavier double yarn

rest, the inside one being fitted with springs and the outside one rocking. The rocking motion is caused by eccentrics mounted on the crankshaft. In the case of the negative let-off motion, the loom is equipped with a double yarn rest, the inside one being set freely and the outside one rocking. (See picture No. 9 Yarn rest for the negative warp let-off motion.)

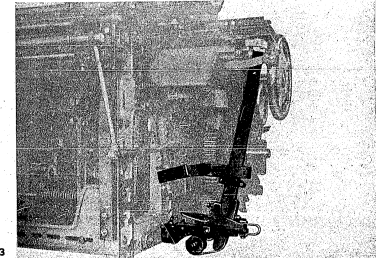
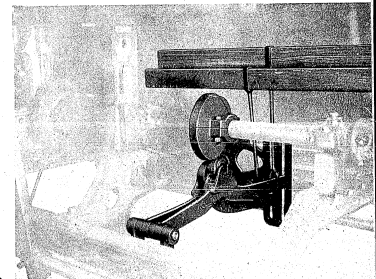
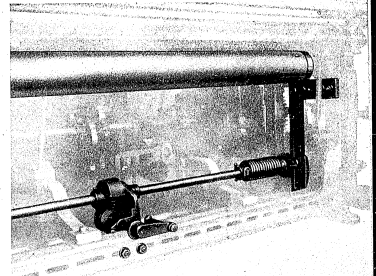


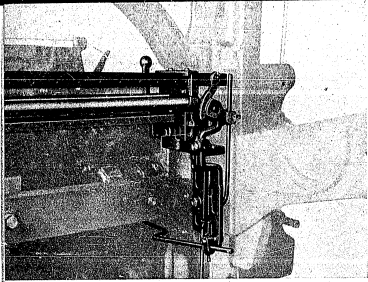
**TEMPLES** are mounted on a rod fitted with springs which prevents any damage of the shuttle. (See picture No. 10.) On the magazine side the temple is equipped with special scissors which reliably cut the weft projecting upon the pirn replacement.

**WINDING-ON ARRANGEMENT.** The goods roller is pressed on the sand roller by means of toothed combs and springs. The sand roller is covered with a perforated sheet. The maximum diameter of the winding-on of the goods roller is 350 mm. (See picture No. 11.)

**SHEDDING MOTION.** The standard loom equipment includes a two-shaft treading motion for plain weave. (See picture No. 12.) The eccentric resist is 120° or 150°. It is also possible to equip the loom with a 2- to 4-shaft, or 2- to 5-shaft shedding motion for basic weaves. An edge device and a dobby up to 16 shafts may also be added.

**PICKING MOTION** is of a lower system with pickers and rock mounted picking arms. The picking eccentrics are split and adjustable. Their tip is specially hardened and can be easily replaced. (See picture No. 13.)





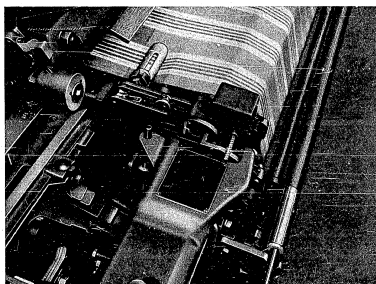
14

**SHUTTLE AND PIRN.** The ES Looms are adjusted to take normalized right side shuttles for automatic pirn replacement. (Shuttles with a right-side guide.) The opening for the weft is placed in the middle. The pirns for these shuttles are of 27 mm or 30 mm head dia. and are provided with steel rings.

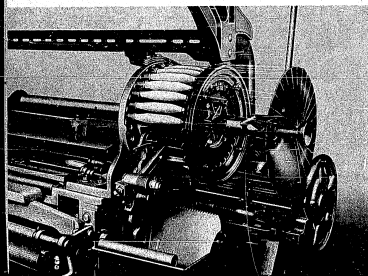
**WARP STOP MOTION** is a mechanical, four-row type, driven by the lower shaft either by means of an excenter, or by a gear, see picture No. 14, or an electrical six-row one.

**WEFT STOP MOTION.** The looms are equipped with a weft fork placed on the left side of the loom, which is automatically stopped in the event of weft breakage. (See picture No. 15.) It is alternatively possible to adjust it so that instead of stopping the loom, it replaces a new pirn without interrupting the run of the loom.

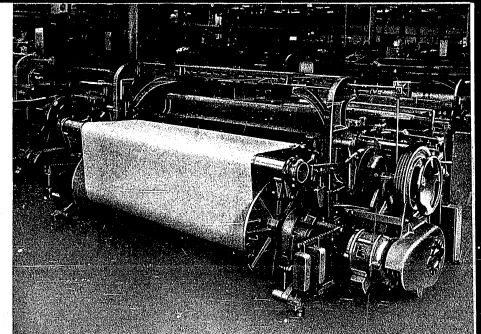
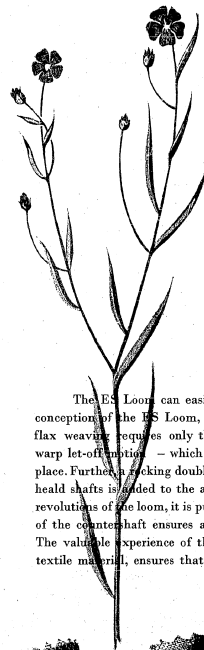
**PIRN REPLACEMENT** is carried out automatically by means of a drum magazine holding 28 pirns. It is operated either by a mechanical or electrical weft feeler. When replacing the pirn, the shuttle position is controlled by a weft-end cutter serving for cutting-off and holding the previous weft. (See picture No. 16.)



15

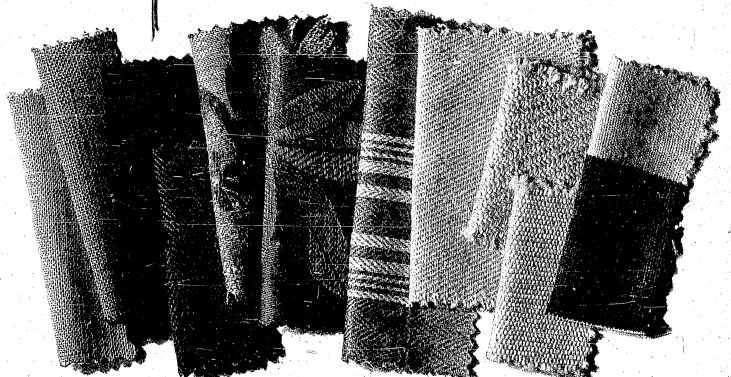


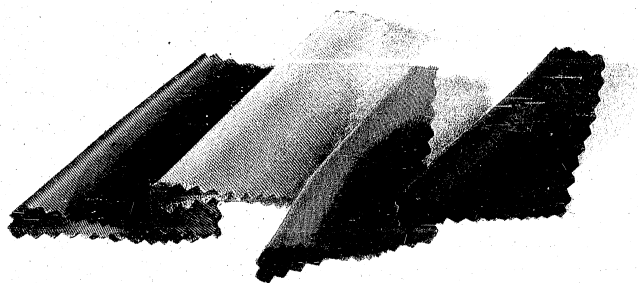
16



### EXECUTION OF THE LOOM FOR FLAX WEAVING

The ES Loom can easily be adjusted for weaving flax fabric. As it is evident from the general conception of the ES Loom, some essential changes in construction are excluded. The execution for flax weaving requires only the special functioning of several mechanisms. In this case the negative warp let-off motion - which is especially suitable for high warp tension - is concerned in the first place. Further, packing double yarn rest in an alternative execution for a shorter or longer distance of heald shafts is added to the above. As the characteristics of flax sometimes require reductions in the revolutions of the loom, it is purposely equipped with a countershaft in the drive. A special arrangement of the countershaft ensures a continuous change of revolutions in a range of approx 30 revolutions. The valuable experience of the Czechoslovak Textile Industry in processing flax, which is its home textile material, ensures that this loom exactly meets all requirements of flax weaving.





### EXECUTION OF THE LOOM FOR RAYON WEAVING

In order to comply with the universal wishes of our customers we have also started the manufacture of ES Looms adjusted for rayon weaving. These looms are manufactured in the ES I execution and in widths of 135 cm and 175 cm, which are mostly required. This case also concerns the universal execution of the ES Loom. However, due to the individual characteristics of rayon, some special modifications are necessary, which, on the other hand, only slightly alter the construction, the basic conception of the loom remaining unchanged. It is necessary to stress especially the increase of revolutions enabled by the different characteristics of cotton and rayon fibre. The yarn rest is special, simple and turnable. The shuttle race is plush covered and so are the discs of the drum magazine through which the rayon threads pass. The temples are special with a single ring. The sand roller is covered with emery cloth and provided with a special pressing-on bar to prevent slipping. The shuttle is provided with a special guide and web braking. Another peculiarity is the warp beam made in a lighter execution, especially with regard to flanges. It has also been found necessary to adjust the negative warp let-off motion to suit reduced warp tensioning. The well proved and expedient design of the ES Loom together with these slight modifications, ensure that our customers will be fully satisfied with our looms and that they will obtain a machine which will assist them in improving the productivity of their weaving mills.

We finally present a summary of the executions of the ES Loom mostly required up to now by our customers:

### EXECUTION FOR COTTON

|                                 | Type ES II B     |        |                  |        |
|---------------------------------|------------------|--------|------------------|--------|
|                                 | 135              | 175    | 195              | 225    |
| Reed space                      | 125              | 165    | 185              | 215    |
| Working width                   | 300-450 gr/sq. m |        | 250-350 gr/sq. m |        |
| Max. width of fabric            | 0.8              |        | 1.1              |        |
| Required power in kW            | 1950             | 3050   | 2150             | 2350   |
| Net weight in kilos             | 2750             | 2850   | 3000             | 3250   |
| Gross weight in kilos           |                  |        |                  |        |
| Dimensions of seaworthy packing |                  |        |                  |        |
| Height                          | 205 cm           | 205 cm | 205 cm           | 205 cm |
| Width                           | 154 cm           | 154 cm | 154 cm           | 154 cm |
| Length                          | 301 cm           | 341 cm | 361 cm           | 391 cm |

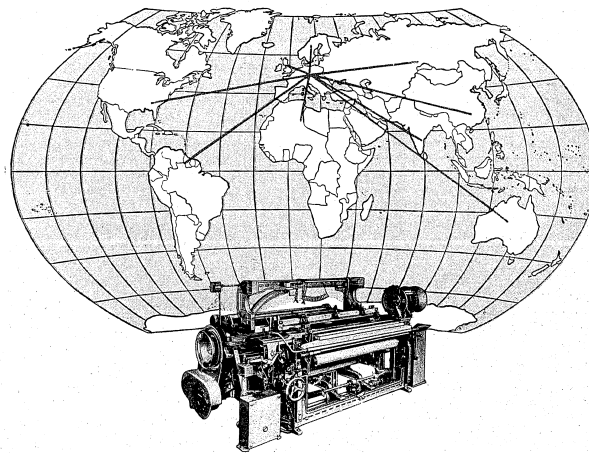
### EXECUTION FOR FLAX

The type ES II LN has been required and manufactured until now in the same widths as the above looms for cotton. Therefore the data for cotton looms apply to flax looms.

### EXECUTION FOR RAYON

|                                 | Type ES I R      |                  |
|---------------------------------|------------------|------------------|
|                                 | 135              | 175              |
| Reed space                      | 125              | 165              |
| Working width                   | 150-300 gr/sq. m | 150-250 gr/sq. m |
| Max. weight of fabric           | 0.8              | 1.1              |
| Required power in kW            | 1750 kg          | 1800 kg          |
| Net weight                      | 2550 kg          | 2600 kg          |
| Gross weight                    |                  |                  |
| Dimensions of seaworthy packing |                  |                  |
| Height                          | 205 cm           | 205 cm           |
| Width                           | 154 cm           | 154 cm           |
| Length                          | 301 cm           | 341 cm           |

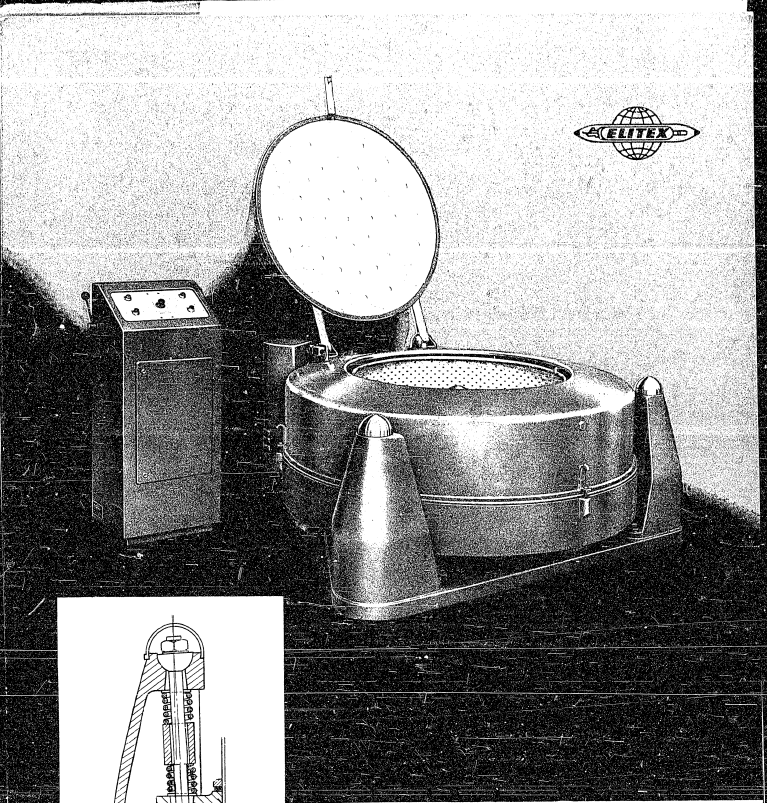
Our looms are continuously being improved and for this reason we reserve the right to alter all the technical data, if necessary.



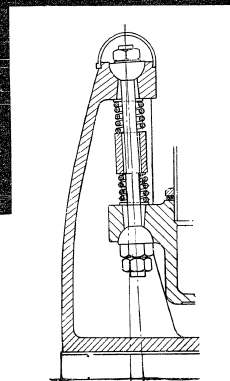
When buying the ES Looms you will also become a member of our great circle of fully satisfied customers. Make the best use of our attractive prices and short delivery terms. You will thus ensure a really advantageous possibility of investing your capital and a considerable margin in your undertaking.



**КОЛО**  
КАНА И ЦЕНТРОКОВКА

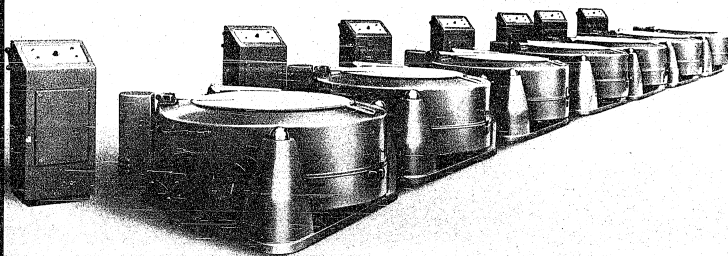


**ELITEK**



**SUSPENDED, DIRECT  
ELECTRICALLY-DRIVEN HYDROEXTRACTORS**  
SERIES 4510





SUSPENDED DIRECT ELECTRICALLY-DRIVEN HYDROEXTRACTORS 4510

Hydroextracting is recognised throughout the Textile Industry as being the only Economical and Efficient Method of Dehydrating Raw Materials, Yarns and Fabrics during the various stages of processing.

Absolute Uniform Dryness is always obtained, and as the materials are not subjected to Pressure, Squeezing or Tension, there is no possible danger of staining or damaging the goods.

Our standardised, Suspended, direct electrically - driven Hydroextractor, Model 4510 produced in series is well-suited (with a few exceptions) for the whizzing of all classes of textile materials, yarns and fabrics. The basket may be adapted to suit special purposes. It can be Vulcanite or Lead lined for the treatment of goods with a higher contents of acid, etc. The machine of standard type consists of a base plate with suspension columns, pan-shaped bed, pinion box, basket, whizzer jacket, separate electric drive, brake and switch cupboard.

In addition the automatic types are fitted with equipment for automatic control.

Our whizzers are made in the following sizes:

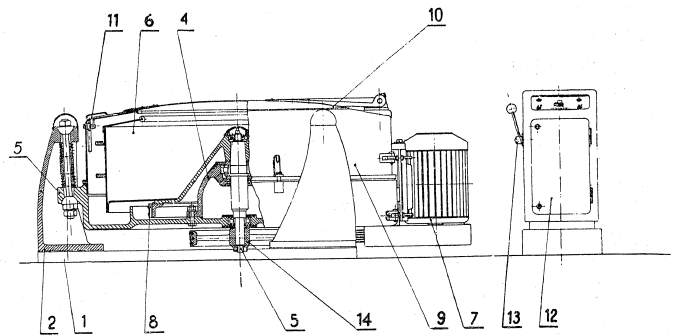
19.7" 33.4" 39.4" 47.3" and 59" which is equal to  
500 mm 850 mm 1000 mm 1200 mm and 1500 mm Basket Diameter.

The first two types are non-automatic (with hand brake), the last three are automatic (with automatic braking and stopping).

GENERAL DESCRIPTION

On the cast iron base plate three suspension columns are bolted, in the ball sockets of which the pan-shaped bed is flexibly suspended by tie rods with spherical ends, so that the bed may be slightly moved in all directions. This permits perfect compensation for the basket wobble or vibration.

At the bottom of the bed an outlet is provided. In the middle of the bed bottom is the pinion box with the basket spindle rotating in anti-friction bearings. On the upper end of the spindle is a cone for attaching the basket. The lower end of the spindle carries the belt pulley.



- |                     |                      |
|---------------------|----------------------|
| 1 base plate        | 8 band brake         |
| 2 suspension column | 9 whizzer jacket     |
| 3 pan-shaped bed    | 10 safety cover      |
| 4 pinion box        | 11 pneumatic closing |
| 5 basket spindle    | 12 switch cupboard   |
| 6 basket            | 13 main switch       |
| 7 electric motor    | 14 V-belt pulley     |

The strong steel whizzer jacket is bolted watertight to the bed. The cover made of stainless material is of special design to eliminate any deflection. All types of our whizzers have pneumatic closing to prevent the cover from being raised until the basket has completely stopped. Apart from this arrangement the automatic types are fitted with a limit switch.

The interlocks function as follows: The limit switch cuts out the motor on the slight raising of the cover, which can occur only during a short time after the machine has been started, when the basket rotates at a low speed and the pneumatic closing is not yet in action. In this case the limit switch stops instantly the machine, so that accident cannot occur.

On the other hand, if the basket rotates at full speed the pneumatic closing is in action; consequently the cover cannot be raised.

**When the cover is raised the machine cannot be started**

The basket consists of a cast-iron bottom lined with stainless steel plate and fitted with a brake ring for the band brake,

as well as of a perforated shell also made of stainless steel plate.

The basket is mounted on a spindle. It is secured by a nut and accurately balanced. Its accurate workmanship and reliability in service is guaranteed by an official test chart supplied with the machine.

The machine is driven by an electric motor, which is mounted so as to enable an easy belt tension adjustment.

Special attention has been paid to the electrical equipment of our whizzers. The switch cupboard is built as an independent unit containing the main switch, push buttons for the remote control and other accessories.

The automatic control functions so that after the adjusted centrifuging period has passed the motor is automatically cut out and the brake put in action. All electrical equipment for the automatic function and motor protection, as well as for the control is centralised in the above mentioned watertight closed switch cupboard.

The following functions are effected automatically: The motor is cut out after the adjusted centrifuging period has passed.

The brake is put in action after the motor has been cut out. The cover is secured against raising after the machine has been started.

**OUTSTANDING FEATURES**

High starting torque motor of special design and construction can be coupled directly to the basket spindle without the necessity of a clutch; consequently the construction of the machine is also simplified and the possibility of damage to the motor eliminated. For repairing purposes the motor is easily accessible, and if necessary it can be of the machine is also simplified and the possibility of damage to the motor eliminated. For repairing purposes the motor is easily accessible, and if necessary it can be readily replaced without dismantling the machine. The flexible suspension of the whizzers affording perfect compensation of the basket wobble ensures smooth and

vibrationless running and permits the machine to be placed also in upper storeys. The low over-all height enables an easy operation, as well as loading and unloading of the machine. No expensive foundation is necessary.

Wide circumference of the brake band permits instant stopping of the machine.

Safety is ensured by a securely interlocked cover, by an efficient and closed watertight automatic arrangement and by accurate balancing and fastening of the basket which is made of high-quality stainless steel.

**TYPES**

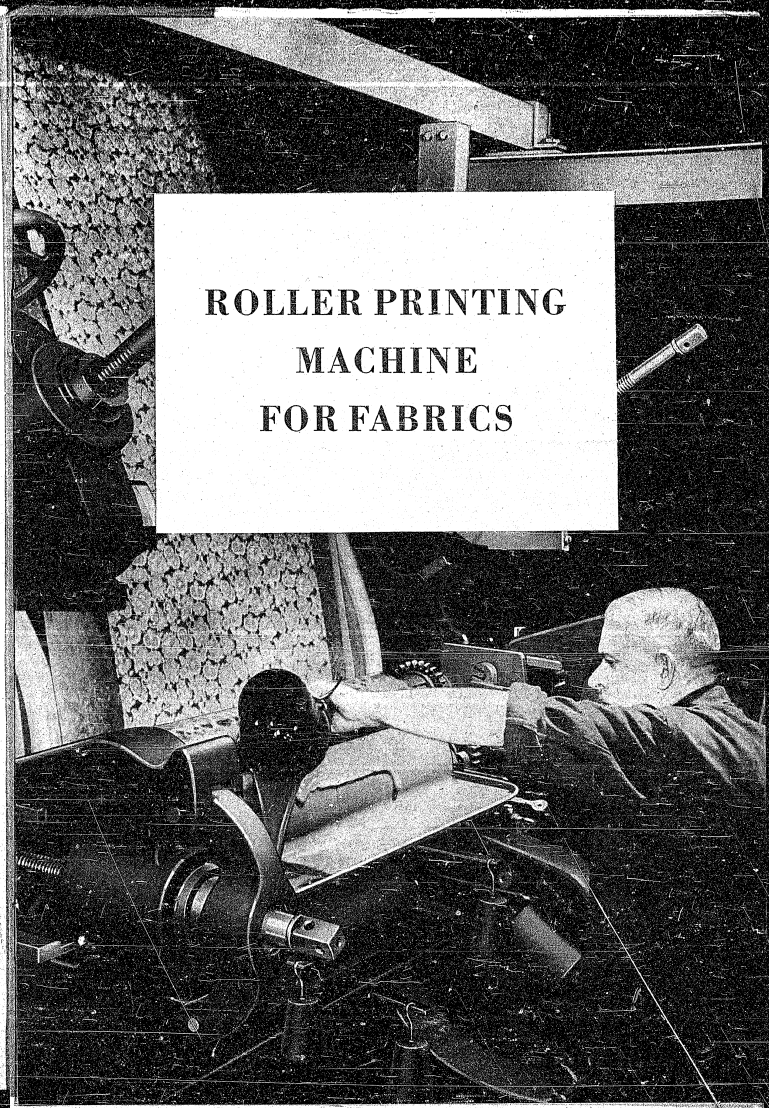
|                               |                 |                 |
|-------------------------------|-----------------|-----------------|
| 4510.12 non-automatic whizzer | 19.7" = 500 mm  | Basket-Diameter |
| 4510.14 " " "                 | 33.4" = 850 mm  | " "             |
| 4510.15 automatic " "         | 39.4" = 1000 mm | " "             |
| 4510.16 " " "                 | 47.3" = 1200 mm | " "             |
| 4510.17 " " "                 | 59.0" = 1500 mm | " "             |

**SPECIFICATIONS**

| Type                          | 4510.12                       | 4510.14                        | 4510.15                        | 4510.16                        | 4510.17                        |
|-------------------------------|-------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Number of Fillings per hour   | 6-7                           | 5-6                            | 4-5                            | 3-4                            | 3-4                            |
| Weight of Filling (wet goods) | Engl. lbs 110<br>Met. 50 kg   | Engl. lbs 180<br>Met. 80 kg    | Engl. lbs 300<br>Met. 136 kg   | Engl. lbs 400<br>Met. 180 kg   | Engl. lbs 550<br>Met. 250 kg   |
| R. p. m. of Basket            | 1200                          | 1000                           | 950                            | 910                            | 770                            |
| Input of Motor                | 2.2 kW                        | 4.4 kW                         | 5.5 kW                         | 7.5 kW                         | 11 kW                          |
| R. p. m. of Motor             | 1400                          | 1400                           | 1400                           | 1400                           | 1400                           |
| Net weight of Machine         | Engl. lbs 730<br>Met. 330 kg  | Engl. lbs 2120<br>Met. 960 kg  | Engl. lbs 3090<br>Met. 1400 kg | Engl. lbs 4080<br>Met. 1850 kg | Engl. lbs 6310<br>Met. 2860 kg |
| Gross weight of Machine       | Engl. lbs 1000<br>Met. 455 kg | Engl. lbs 2560<br>Met. 1160 kg | Engl. lbs 3630<br>Met. 1644 kg | Engl. lbs 4850<br>Met. 2200 kg | Engl. lbs 7020<br>Met. 3160 kg |
| Length                        | Engl. 4'<br>Met. 1230 mm      | Engl. 5' 3"<br>Met. 1590 mm    | Engl. 6' 2"<br>Met. 1870 mm    | Engl. 7'<br>Met. 2125 mm       | Engl. 8' 1"<br>Met. 2475 mm    |
| Width                         | Engl. 2' 11"<br>Met. 880 mm   | Engl. 4' 2"<br>Met. 1260 mm    | Engl. 4' 11"<br>Met. 1500 mm   | Engl. 5' 8"<br>Met. 1730 mm    | Engl. 6' 6"<br>Met. 2030 mm    |
| Height                        | Engl. 2' 6"<br>Met. 760 mm    | Engl. 2' 6"<br>Met. 750 mm     | Engl. 2' 10"<br>Met. 860 mm    | Engl. 3' 1"<br>Met. 950 mm     | Engl. 3' 3"<br>Met. 990 mm     |
| Space required (cubic yards)  | Engl. 1.922<br>Met. 1.5 cbm   | Engl. 3.662<br>Met. 2.8 cbm    | Engl. 5.886<br>Met. 4.5 cbm    | Engl. 8.633<br>Met. 6.6 cbm    | Engl. 9.156<br>Met. 7 cbm      |

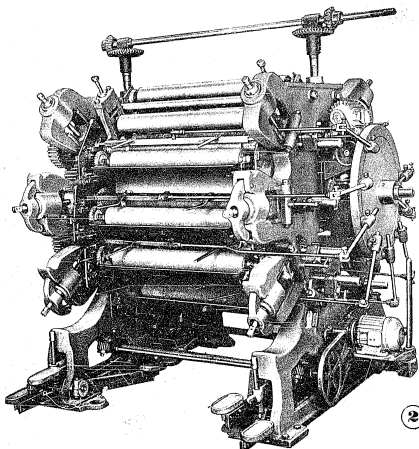
The efficiency of the machine depends on the properties of the goods subjected to centrifugal action. The weight of machine is always including the switch cupboard. We are sure of meeting your requirements if you answer (as far as possible) the questions in our enquiry sheet. Our agent will also be pleased to submit you an offer on request. We also call your attention to the other types of our high-efficiency precision machines, as the machines described in this prospectus represent only a small part of our production programme. If you are interested in other machines, kindly write for leaflets. As improvements in design are continually being made, this specification is not to be regarded as binding in detail, and dimensions are subject to alteration without notice.

**KOVO** PRAHA, CZECHOSLOVAKIA

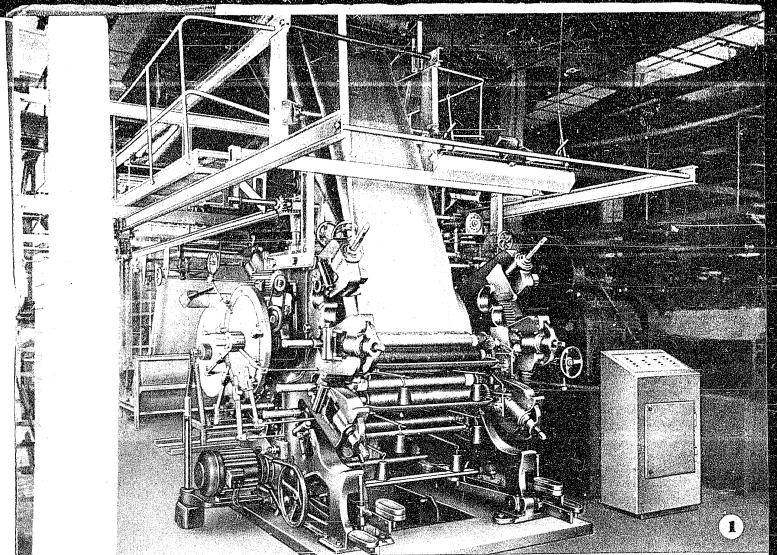


**ROLLER PRINTING  
MACHINE  
FOR FABRICS**

**High Output -  
Print of Quality -  
Reliable Working -  
Easy Operation -**

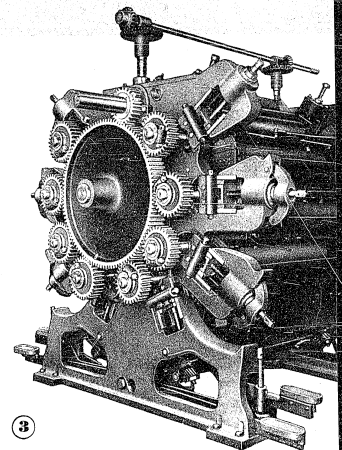


are the four imperative points by which you will be guided when choosing, and eventually, buying your printing machines. Incited by these four requirements we have gone to work of creating textile printing machines which would satisfy the most exacting demands.

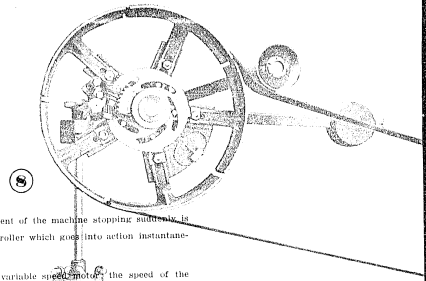
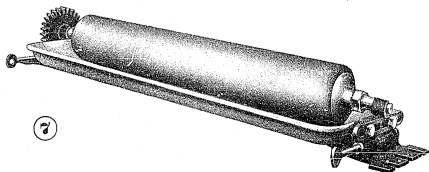
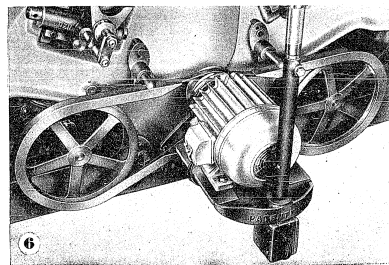
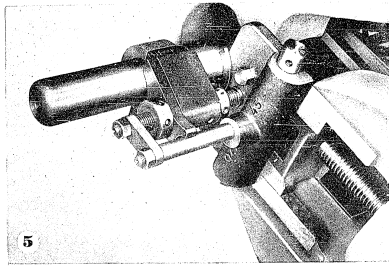
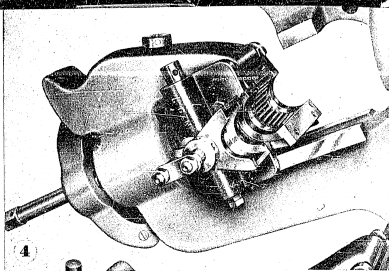


Experiences drawn from a close cooperation between the textile industry, modern chemistry development and between general technical advance have made it possible constantly to improve our machines which are engineering items built in this country for 70 years.

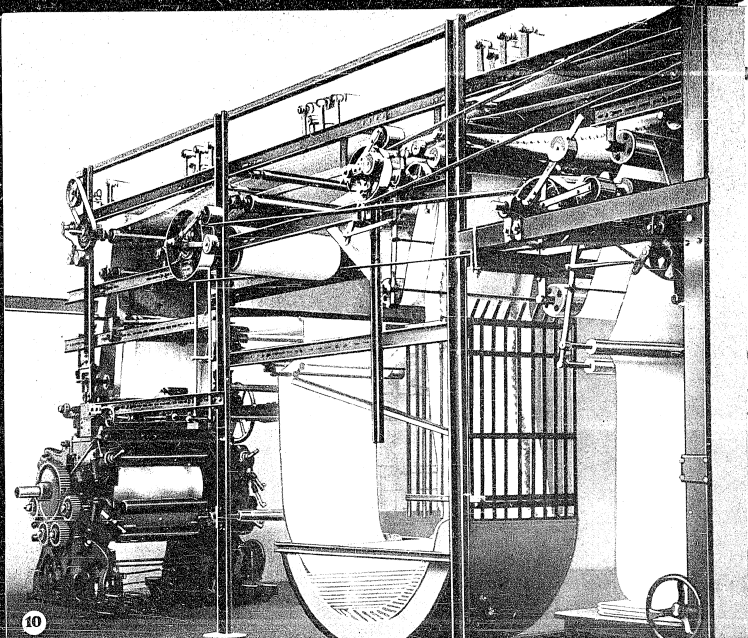
The result of all our endeavours is our modern printing plant (Fig. 1) of which most important is the printing machine (Fig. 2) which offers a number of new features:



- 1) First of all there is the printing mandrel which runs in roller bearings instead of in the usual slide bearings, by which a great economy in driving power is achieved, reduced wear of the entire machine, and a saving in lubricants. Since these bearings do not require any particular attendance the machine is more reliable in operation and enables reaching higher outputs. Insertion and removal of the mandrels is the same as that in bronze bushes, the roller bearings lying open and consisting of rollers joined up into an endless belt. (Fig. 4)
- 2) As against the old attendance of the machine from both sides this machine provides axial mandrel adjustment which is done only from one side of the machine. (Fig. 5)
- 3) The colour boxes have rounded corners so that they can be easily and entirely cleaned. (Fig. 7)
- 4) The metre counting device with signalling equipment and with speed gauger enables economical operation and continuous following up of the work in progress.
- 5) In the old machines the lifting and lowering of the complete bottom colour supplying units was tedious and there was always a danger of damaging the copper roller. This difficulty is eliminated by the use of an electromechanical device performing the heavy work. (Fig. 6)
- 6) The old way of driving the doctor blades so that their motion was in agreement with the revolutions of the machine has been replaced by a separate doctor blade drive shown in Fig. 2. This improvement removes doctor chatter and the possible appearance of colour streaks on the fabric.



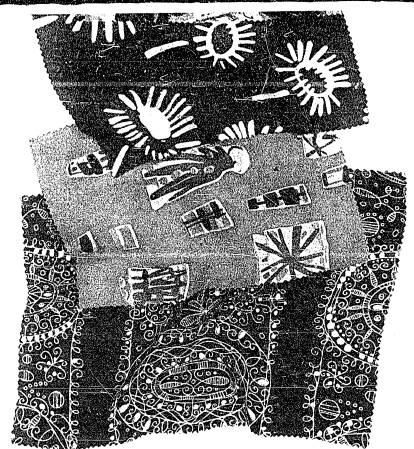
- 7) Any danger of the doctor blades jamming in the event of the machine stopping suddenly is eliminated by the segmented brake of the press-on roller which goes into action instantaneously.
  - 8) In standard execution the machine is driven by a variable speed motor, the speed of the machines printing with a small number of colours is reduced by a speed-gauger wheel gearing, whereas machines printing a large number of colours are provided with a two-step speed wheel gearing.
- Not only the construction of printing machines has received great attention in our works, but also the building of all the machines supplementing the first mentioned, for instance:
- 9) The Drying Chamber which is supplied as part of the printing plant and which, according to expert opinion from all over the world, belongs among the best drying systems for use after printing. It has been designed for drying any kind of printed fabric, no matter what kind of dye has been used, and consists of four or five drying and cooling sections. Hot air from the air heater is driven into the drying sections by a fan which ensures that the fabric is evenly dried in all parts of the drying space. The average steam consumption is 150 kg/hour, but varies according to the kind, thickness and width of the fabric, the kind of colour used, the printing speed, as well as the size of the printed pattern. Due to the purposeful design of the drying chamber heat losses have been reduced to a minimum.
  - 10) The sheet iron cylinders and the sheet iron skeleton cylinders of the drying chamber are protected against corrosion. All the cylinders run in ball bearings which eliminates the danger of soiling the fabric, ensures safe and tidy work, smooth running of the machine and operation without attendance; also the amount of driving power required is thus very low.
  - 11) After a finished printing job the dried fabric may be removed from the drying chamber by a special device while the printing machine is being prepared for further operation.
  - 12) A variable belt pulley enabling pulley circumference adjustment during operation of the machine enables regulating the fabric or back-grey tension.
  - 13) When thin fabric is printed the colour often penetrates to the wrong side of the fabric and thus it becomes necessary to protect the front rollers of the drying chamber from soiling by colour. This is done by the back-grey being looped into the drying section, from where it is led pre-dried back into the printing machine, and only then it enters the drying chamber for final drying.
  - 14) Smooth operation of the printing plant is assured by the use of a back-grey several hundred metres long. During operation it lies platted down in a folding gear which acts as suitably arranged back-grey magazines (fig. 10), connected with a reversing device enabling using both sides of the back-grey, so that there is no uneven wear of the latter.
  - 15) The tendency of concentrating the control and the starting of the machine in one spot has led to the providing of a control chest equipped with control push-buttons and indicating lights. (Fig. 9)



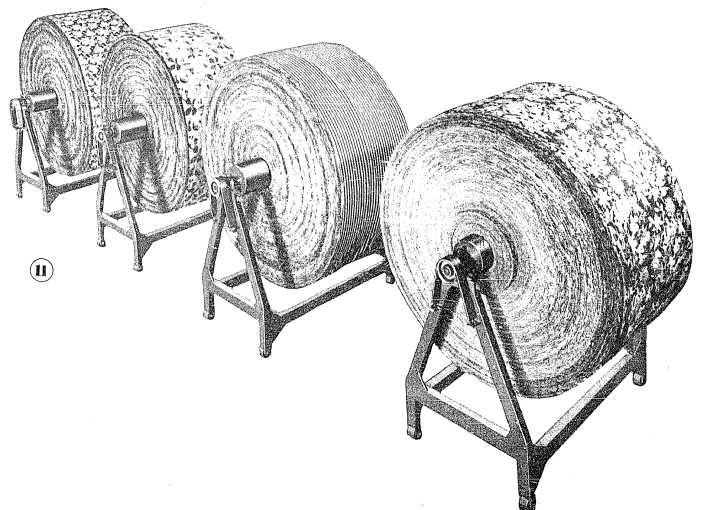
No printing and drying plant is complete without an efficient Winding-on device which can be connected to any machine of the working process and which enables working with large, time saving cloth rolls. It is an advantage to work with several Supporting Stands (Fig. 11) for transporting the cloth rolls. The Winding-off Devices resemble the Winding-on Devices and are accommodated right behind the printing machine, thus enabling winding-off from large cloth rolls.

Another useful item is the hoisting crane, fitted above the printing machine, for lifting the printing rollers out, or lowering them into the machine. The crane requires only one operator.

The air driven selvage guiders introducing the fabric and the back-grey correctly into the machine are a further safeguard of faultless work.



Much time and money can be saved in the printing process when working with washable blankets. The ones supplied with our printing machines wear only to the smallest degree, due to their careful design and arrangement. The washed blanket is immediately dried by hot air in a special compartment of the drying chamber.



Three alternative designs of our printing machine are available, to cater for individual needs, and it is one of the tasks of our staff to assist the customer to choose that machine which will fit in with the operation of his mill.

The three alternative designs are:

1. The printing equipment working with ordinary blanket and back-grey, for one sided printing of light and medium weight fabrics, strongly through-coloured.
2. The printing equipment working with a washable blanket and without back-grey, for printing medium and heavy weight fabrics which are not appreciably through coloured.
3. The printing equipment representing a combination of the two first mentioned alternatives.

On request we supply:

1. the drying chamber on the same floor with the printing machine,
2. the drying chamber on the floor above the printing machine.

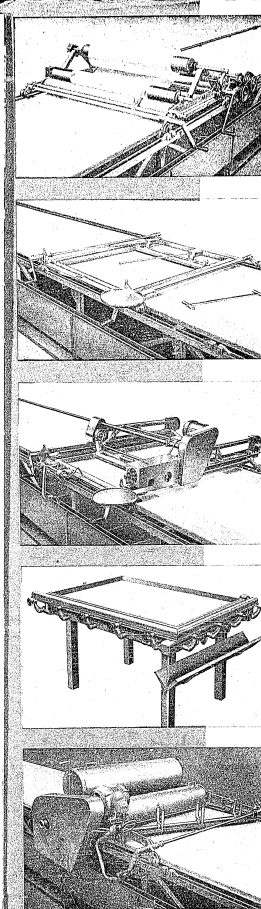
The standard printing equipment is supplied for a fabric width of 1.000 mm = 40",  
or 1.400 mm = 55"  
and consists of the following parts:

- A printing machine for 1, 2, 3, 4, 6, 8 or 10 colours,
- a speed wheel gearing,
- a drying chamber,
- a winding-off device with one supporting stand,
- a winding on device with one supporting stand,
- a crane for inserting the printing rollers into the printing machine,
- 2 pairs of air driven selvage guiders,
- a complete electrical outfit, and a washing machine for machines working with washable blankets.

With the above named printing equipment a number of further essentials may be supplied such as steam agers, foulards, hotflues, open width washing machines, vacuum type colour filtering machines, colour boiling apparatus, forcing machines for fitting rollers on to mandrels, a crane for the copper roller storage, an engraving machine for engraving patterns on the copper rollers—complete with a grinding machine, etc. The enumerated items are named only as examples and do not by far represent a complete specification of the machines which we are able to supply with the printing plant. You are invited to make your specific enquiries whereupon we shall furnish you with our offer on any machine of our production range.



PRAHA - CZECHOSLOVAKIA



We normally supply the following:

**A PASTING APPARATUS — Type 4482 (Fig. 1)**

This carries the rolls of fabric and is hand operated to ensure that the smoothing and pasting of the fabric is constantly controlled. The apparatus fixes the fabric to the table surface without wrinkles and ten times quicker than when pinning and hand pasting methods are used.

**A PRINTING MECHANISM — Type 4480 and 4481 (Figs. 2 and 3)** with hand operated or automatic spreading of the colour over the screen. The screens travel on rails from one position to another. Type 4480, which is hand operated, is used for fabric widths up to 1400 mm. On the type 4481 automatic printing apparatus the squeezes are driven by two endless chains.

**A SCREEN FRAME**

made of a special steel section carries the gauze with the design. By slightly heating the thermoplastic substance in the grooves of the frame the screen fabric can be fixed to the frame easily and reliably.

**A DETACHING AND WINDING ON EQUIPMENT — Type 4485** raises the freshly printed fabric from the table and winds it on the star shaped winder. Individual layers of the fabric do not contact each other on the winder so that no smudges occur. The wound on fabric is then dried in a drying chamber.

**A WASHING APPARATUS — Types 4483 and 4484 (Fig. 5)**

removes the remainders of paste and colour from the table. It is supplied with a manual or an automatic motion. Type 4483 is driven by electric power and works automatically. It moistens the surface of the printing table, washes it, and wipes the dirty water into the troughs provided on both sides of the printing table.

**PUT-AWAY TABLES**

to which those mechanisms are removed which are not in use at the moment.

**SLIDING STAGES**

for comfortable moving of individual mechanisms from one printing table to another, and from there to the put-away table.

**RAILS**

specially milled; fitted to the whole length of the printing table.

**DOUBLE REPEAT PIECES**

on the rail; on very wide tables also simple stops on the rear rail. The repeat pieces ensure accurate registering of the screen.

**A TENSIONING TABLE — Type 4487 (Fig. 4)**

for uniform fixing of the screen gauze to the frame by an air operated mechanism.

**OUR MECHANISED SCREEN PRINTING EQUIPMENT**

is five times more efficient than hand operated printing machinery. The preparing of the screens is incomparably easier, quicker, and cheaper than the engraving of rollers for roller printing. It makes full use of the colour shades without the possibility of their softening each other, a danger always present with machine printing by means of rollers. Multiple squeezing of the colour ensures perfect and bright colouring of the fabric. Our machinery can be fixed to any wooden, metal, or concrete tables which are provided with a felt covering and a washable foil.

Ask for a detailed offer!

P R A H A - C Z E C H O S L O V A K I A



**M**ulticolour printing of fabric - by an improved method

The mechanised screen printing of fabrics on firm tables means an increased output in your mill, extended production possibilities and a substantial reduction of your production costs.

A simple equipment for printing every kind of fabric, without danger of the colours running or smudging. Economical printing even of small quantities of the finest types of fashionable and luxury fabrics, as well as of large surfaces and large patterns.