

F. WILKENS.

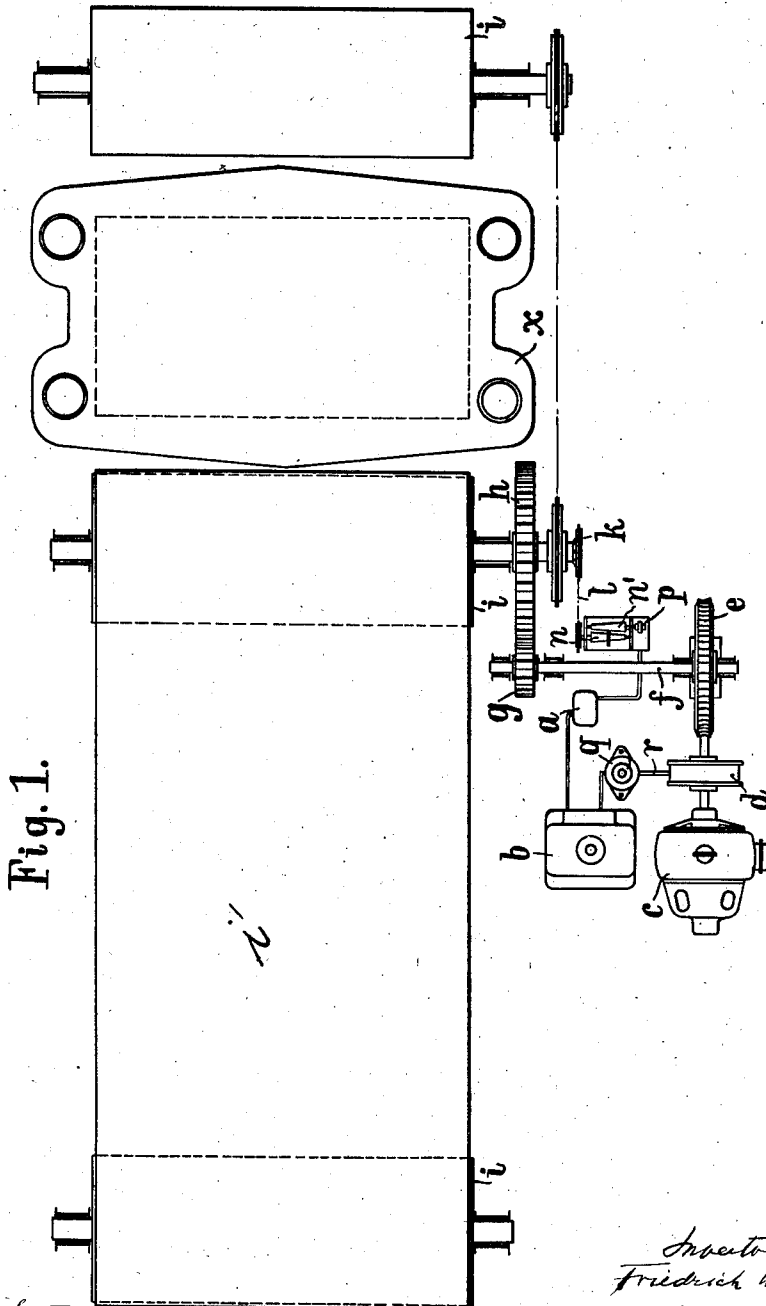
APPARATUS FOR FEEDING A WEB CARRYING LINOLEUM INTO INLAID LINOLEUM PRESSES.

APPLICATION FILED NOV. 18, 1911.

1,053,335.

Patented Feb. 18, 1913.

8 SHEETS—SHEET 1.



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Patented Feb. 18, 1913.

8 SHEETS—SHEET 2.

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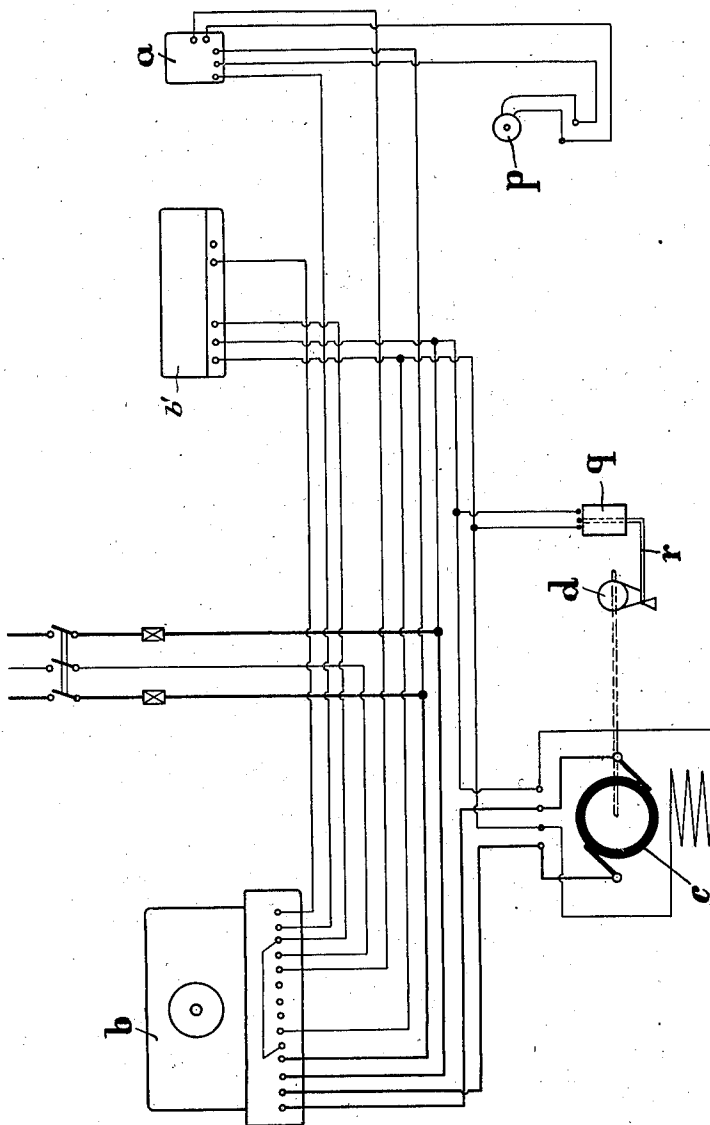
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8 SHEETS—SHEET 3.

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Fig. 3.



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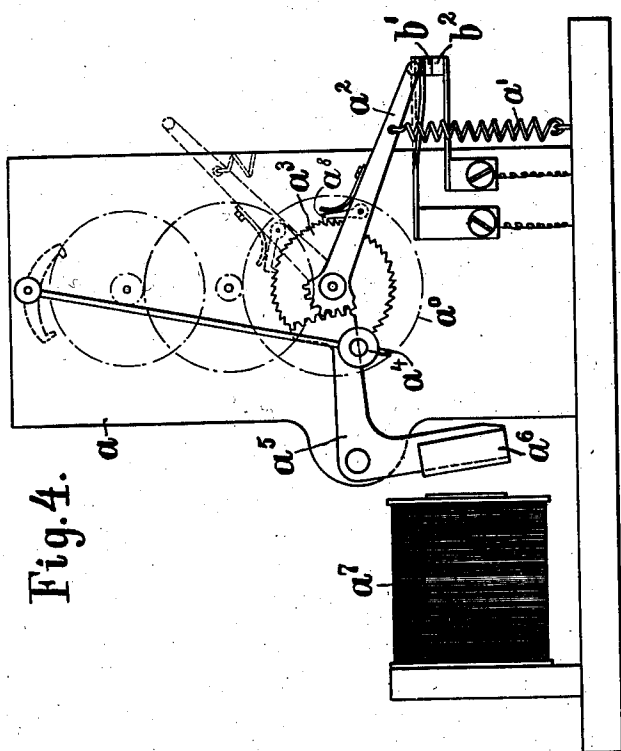


Fig. 4.

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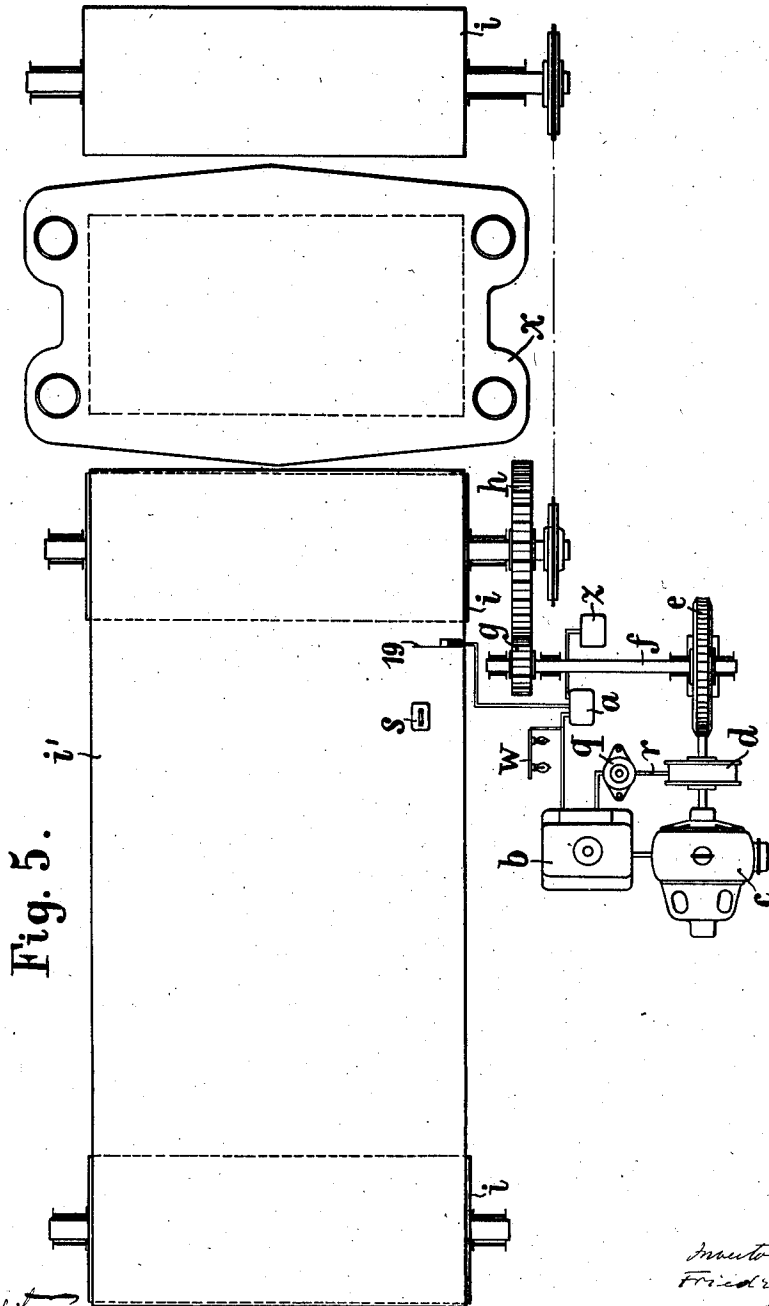


Fig. 5.

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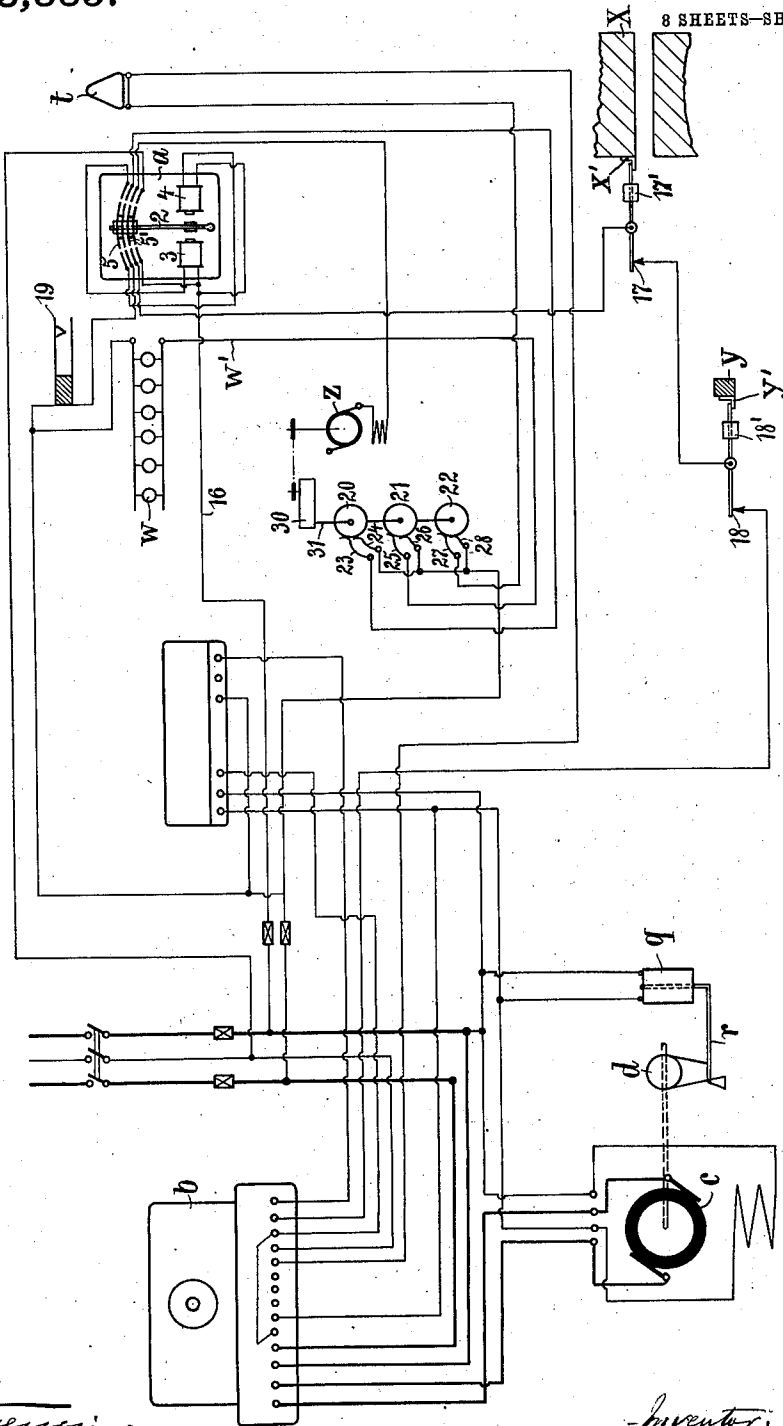
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8 SHEETS—SHEET 6.

Fig. 6.



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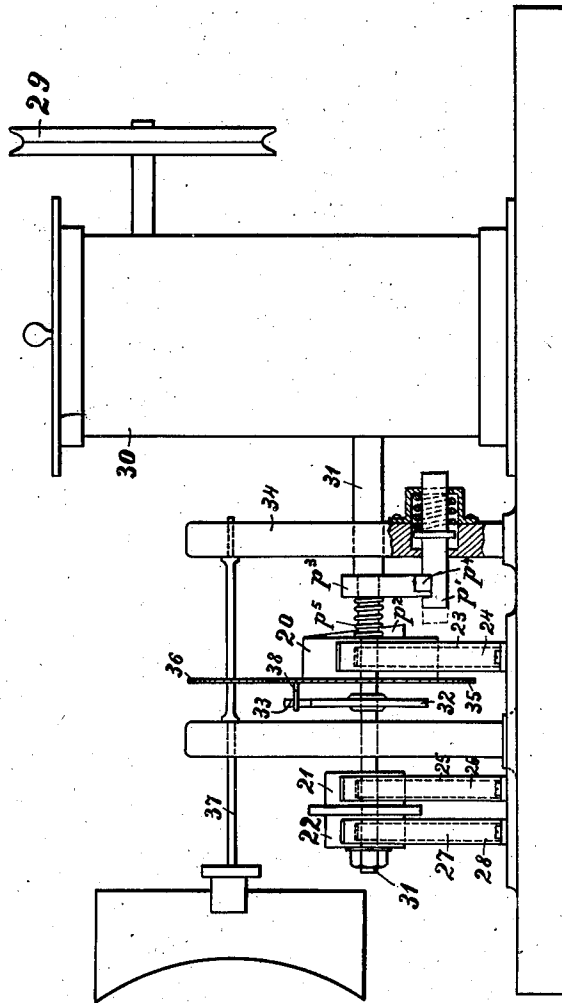
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8 SHEETS—SHEET 7.

Fig. 7.



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8 SHEETS—SHEET 8.

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Fig. 9.

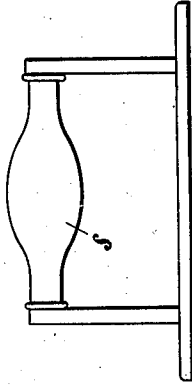
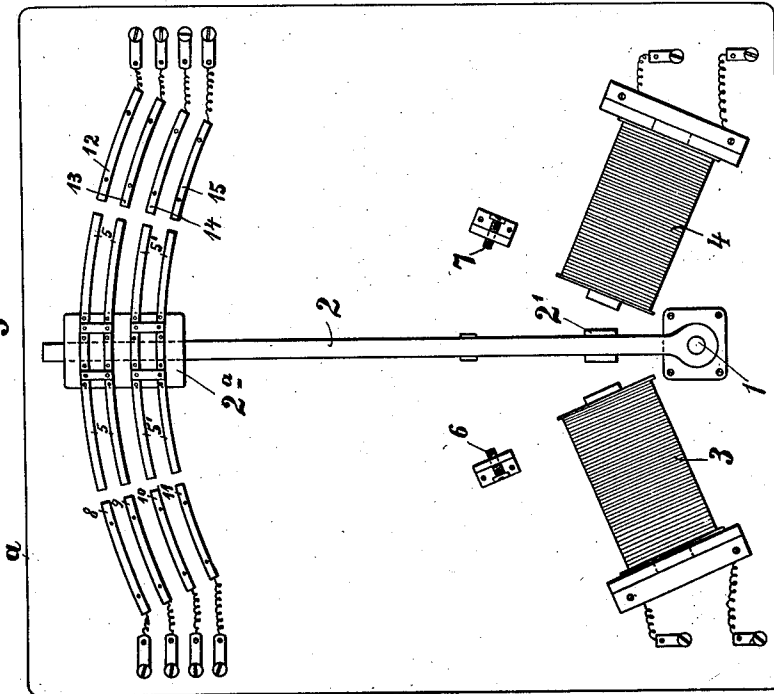


Fig. 8.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR FEEDING A WEB CARRYING LINOLEUM INTO INLAID-LINOLEUM PRESSES.

1,053,335.

Specification of Letters Patent.

Patented Feb. 18, 1913.

Application filed November 18, 1911. Serial No. 661,126.

To all whom it may concern:

Be it known that I, FRIEDRICH WILKENS, a subject of the German Emperor, and residing at Delmenhorst, Germany, have invented certain new and useful Improvements in Apparatus for Feeding a Web Carrying Linoleum into Inlaid-Linoleum Presses, of which the following is a specification.

10 This invention relates to mechanically driven devices for feeding the supporting fabric together with the loose linoleum mass applied thereon in the form of a pattern to inlaid linoleum presses.

15 It was heretofore customary for the supporting fabric together with the loose linoleum mass applied thereon to be fed forward to the inlaid linoleum press either by hand or by means of a motor *i. e.* mechanically.

20 In both cases the supporting fabric could not readily be fed an exactly predetermined distance, nor was it possible to main the hourly capacity at a maximum, because in the one and in the other case the feed was subject to the estimate of the operator both as to the speed and the intervals at which it was to take place.

25 A primary object of this invention is to obviate these disadvantages and to secure not only a uniform feed of the supporting fabric, but also to render the feed independent of the judgment of the operator.

30 To this end, according to one form of my invention I provide a remote control time switch which closes the circuit of the magnet of an automatic starter and thereby connects into circuit the driving motor for the feed of the web of fabric. A quick-break switch is thereby driven by the feed roll of the fabric; this switch can be adjusted by means of change speed gear to various lengths of feed and releases the electromagnet of the automatic starter by means of the remote control time switch whose clockwork it simultaneously winds up. An electromagnetic brake connected in shunt provides for the motor stopping as rapidly as possible. At various parts of the table for the inlaid work are provided 50 press switches which enable the operator to prevent the motor starting too early. At the time switch is provided in addition a short-circuiting switch for allowing the motor to run continuously when a worked-up bale of

jute is to be replaced and a new supporting fabric is to be drawn in.

According to another form of the invention the driving motor is cut into and out of circuit entirely electrically in such a manner that the feed length of the linoleum can be readily varied during the feeding operation and that the interval between the stopping and restarting of the driving motor can be readily varied as desired during the manufacture of the next length of the linoleum to be drawn forward.

Another improvement of this modification is the provision of two contacts interpolated in the circuit of the driving motor. One of the two contacts is connected with the press stamp and the other with the pattern lifting frame. Both contacts are open, if the press stamp and the pattern lifting frame rest upon the linoleum. Therefore, the motor circuit can only be closed when both the stamp and also the frame are lifted from the linoleum.

In the accompanying drawings, Figures 1 to 4 and Figs. 5 to 9 show two illustrative embodiments of the invention by way of example. Fig. 1 is a top plan view showing the general arrangement of the plant according to the one embodiment, Figs. 2 and 2^a are front and end elevation, respectively, showing the quick-break switch connected with a change speed gear, Fig. 2^b shows a detail of Fig. 2. Fig. 3 is a diagram of connections and Fig. 4 shows the remote control time switch in elevation. Fig. 5 is a top plan view showing the general arrangement of the entire plant according to the second embodiment, Fig. 6 is a diagram of connections, and Fig. 7 shows the time switch for stopping the driving motor in elevation; Fig. 8 shows, enlarged, the switch mechanism comprised in the diagram Fig. 6, and Fig. 9 is a side elevation of the driver for the contact which limits the feed of the web of fabric.

Referring firstly to Figs. 1 to 4, the drive of the feed roll *i* for the conveyer belt *i'* carrying the web of fabric is brought about by a remote control time switch *a* of any desired construction (Figs. 1 and 3) which closes the circuit of the electromagnet of an automatic starter *b* over an electric resistance *b'* both of known construction by which the driving motor *e* is started.

The remote control time switch a may be arranged in the manner shown in Fig. 4. A spring a' acts on the first driving wheel a^0 of clockwork mechanism by means of a lever a^2 whose one arm carries a pawl a^3 coacting with the teeth of a ratchet a^3 fast on the shaft of the first driving wheel a . The other arm of the lever a^2 is formed as a toothed sector in which meshes a second toothed sector constituting the end of one arm of a bell-crank lever a^5 . The other arm of this bell-crank lever carries the armature a^6 of the electromagnet a^7 which is connected with the hereinafter described quick-break switch and attracts its armature when the quick-break switch is closed. The lever a^2 is thereby rocked upward by means of the two toothed sectors and the spring a' is tensioned. The latter then acts by means of the pawl a^3 on the clockwork mechanism whose pendulum-bob a^4 is adjustable, in order that the time which the clockwork requires until it has run down or until the spring a' is distensioned may be adjusted as desired. This time switch a comprises two contact pieces b', b^2 which are apart while the clockwork is working and are connected to the coil of the magnet of the automatic starter b . When the clockwork has almost run down the lever a^2 is in the position shown in full lines in Fig. 4 and under the influence of the spring a' presses together the two contact pieces b', b^2 . The circuit of the coil of the magnet of the automatic starter b is thereby closed and the driving motor c started. This motor c drives the feed roll i through the medium of a clutch d , worm gearing e , the countershaft f and spur gearing g, h . The shaft of the feed roll i carries a sprocket wheel k which drives a quick-break switch p by means of a chain l . This switch p comprises any desired suitable change speed gear consisting, for example, of two adjacent conical rollers n, n' , (Fig. 2) between which is clamped a leather ring o displaceable longitudinally of the rollers by means of a manually driven screw o' , so that the rotation of the one conical roller n is imparted by the leather ring o to the other roller n' . Keyed on the one end of the shaft n^0 of the roller n' is an arm p^3 , having a slanting face p^4 , (Fig. 2^b) and loose on the same end of the shaft is a collar p composed of insulation having let into one part of its periphery a contact piece p^6 (Fig. 2^a). Against the periphery of the collar p slide two insulated contact springs p^5, p^7 which are connected with the coil of the electromagnet a^7 of the remote control time switch a (Fig. 4). The collar p is connected with the one end of a spring p^5 whose other end is secured to the shaft n^0 . Below this shaft is mounted a spring-pressed bolt p' which generally projects so far toward the collar

p that the stop p^2 carried by the latter bears against it, so that the collar is locked and cannot rotate with the roller n' (see Fig. 2 dotted lines). In this position the two contact springs bear on the insulation of the collar p , as shown in Fig. 2 in full lines so that no current can flow through them. The bolt p' has a notch which coacts with the slanting face p^4 of the arm p^3 . Now when the roller n' rotates, the spring p^5 connected with the collar p is tensioned because the collar cannot rotate owing to its being held by the bolt p' . After about one rotation of the roller n' the face p^4 of the arm p^3 pushes the bolt p' backward, so that the collar p is released and under the action of the spring p^5 rotates approximately one revolution, its contact piece p^6 electrically connects together the two contact spring p^6, p^7 for a short time, so that the electromagnet a^7 of the remote control time switch connected therewith is energized, the clockwork is wound up and the spring a' is tensioned. Simultaneously, the contact pieces b', b^2 (Fig. 2) are separated. The circuit of the automatic starter b is thereby broken, so that the circuit of the motor c and, simultaneously, that of a braking magnet q of known construction which influences the band brake r (Fig. 3) is broken. The band brake is applied and the motor c at once stops. The outer casing of the clutch between the motor c and the worm gearing e (Fig. 1) may serve as the brake disk. Immediately after the collar p is released the bolt p' is likewise released by the arm p^3 and snaps back so that it again locks the collar p .

After the elapse of a predetermined time controlled by the time switch the latter, whose clockwork was wound up when the drive of the feed roll i was stopped by the quick-break switch p , switches the automatic starter b into circuit again, whereby the braking magnet q is again energized and the band brake r released. The motor c also starts simultaneously. The play is then repeated afresh. As long as the motor runs the conveyer belt i' is driven and the jute fabric on the belt and the loose linoleum mass applied on the jute fabric are fed under the press.

It is obvious that the speed of the feed and of the change of the interrupted drive of the conveyer belt i' can be adjusted at the time switch a and at the speed change n, n' as desired within certain limits.

Referring now to Figs. 5 to 9, the general arrangement of the driving mechanism for the feed of the web of fabric of the second illustrative embodiment is substantially the same as that described above. A conveyer belt i' for carrying the web of fabric having the linoleum mass to be applied thereon runs over rollers i , of which that

nearest the press x carries on its shaft a gear h meshing with a pinion g whose shaft f is driven through the medium of worm gearing e by the driving motor c when the brake r is released by a magnet q . Connected in series with the motor c is an automatic starter b connected with the switch gear a in the manner which will now be described. This switch gear a may be arranged in various ways, *e. g.* as in Fig. 8. A switch lever 2, carrying an armature 2', and able to rock about a pivot 1, is under the influence of two electromagnets 3, 4 and carries at its free end a piece of insulation 2^a. The latter carries two pairs of wiping springs 5 and 5', the two springs of each pair being connected together. Two stops 6 and 7 limit the range of motion of the lever 2. On the one side in the direction of oscillation of the springs 5, 5' are contact pieces 8, 9 and 10, 11 and on the other side contact pieces 12, 13 and 14, 15. Of these, the contact piece 8 is connected with the electromagnet 4 (Fig. 6) and the contact piece 12 with the electromagnet 3. The two electromagnets 3, 4 have a common return conductor 16. The contact pieces 11 and 15 are connected to the feeders. The contact piece 10 leads to the automatic starter b of the motor c . In the circuit of the contact piece 10 to the automatic starter b are interpolated two contact pieces 17, 18, each of which possesses a weighted lever 17' and 18', respectively, tending to keep the contact open. These weighted levers are located in the range of motion of stops x' , y' of the press stamp x and of the frame y , respectively, each of which in its raised position closes its contact. The contact 9 leads to a feed-limiting contact 19 provided on the press x (Figs. 5 and 6). The contact 14 leads to an auxiliary motor z of a remote control time switch which is shown by itself in Fig. 7 and possesses three switch drums 20, 21, 22 fast on the same shaft 31. Each of these three drums is wiped by two contact springs 23 and 24, 25 and 26, 27 and 28, respectively. Of these, the springs 24, 26 and 28 are connected to a common return conductor, while the spring 23 leads to the contact piece 13 of the switch gear a (Figs. 6 and 8) and the spring 25 to the auxiliary motor z . In addition, a return conductor w' , in which is interpolated a lamp-resistance w , branches off from the line between the motor z and the spring 25. A call bell t is interpolated in the line connecting the spring 27 with the feeder.

The time switch driven by the auxiliary motor z (Fig. 7) is arranged as follows:—The auxiliary motor z directly or indirectly drives the pulley 29 whose motion is speeded down and transmitted by means of double worm-wheel gearing contained in the casing 30 to the shaft 31. The two switch

drums 21 and 22 are fast on this shaft. Each of the drums possesses only at one part of its periphery a contact piece for connecting the springs 25, 26 and 27, 28, respectively. Fast on the shaft 31 is not only a disk 32, carrying a stop 33, but also an arm p^3 having a slanting face p^4 , while the drum 20 is loose on the shaft 31. The rim of the drum 20 is connected with the one end of a spring p^5 whose other end is secured to the shaft 31. A spring-pressed bolt p' is guided under the latter in the frame 34 and the bolt p' generally projects so far that the detent p^2 of the drum 20 bears against it, as shown in dotted lines in Fig. 7, so that the drum 20 cannot participate in the rotation of the shaft 31. In this position the two springs 23, 24 bear on the insulated part of the drum 20, so that no current can flow to the electromagnet 3 of the switch gear a (Figs. 6 and 8). The bolt p' has a recess which coacts with the slanting face p^4 of the arm p^3 . The arrangement and motion of the drum 20 correspond to those of the quick-break switch of the form described above with reference to Fig. 2. When the shaft 31 rotates the spring p^5 mounted thereon and connected with the drum 20 is first tensioned, because the drum 20 cannot rotate as it is held by the bolt p' . After the shaft 31 has rotated almost one revolution the face p^4 of the arm p^3 pushes the bolt p' back so that the latter releases the detent p^2 and the drum 20. This drum is then driven around almost one revolution under the action of the spring p^5 and by means of its contact piece electrically connects the springs 23, 24 for a short time, so that the electromagnet 3 connected with these springs is energized and the switch lever 2 (Figs. 6 and 8) moves into its left-hand position. In order to slow down the motion of the drum 20 somewhat it is connected with a toothed wheel 35 which drives the fan-shaft 37 through the medium of the pinion 36. To prevent the drum 20 rotating more than once its toothed wheel 35 is provided with a pin 38 which is within the reach of the stop 33 of the disk 32. As the drum 20 rotates only when the shaft 31 has already rotated almost one revolution, the stop 33 leads as much in front of the pin 38, and thus admits if almost a complete revolution of the drum 20. The face p^4 of the arm p^3 has such a position that it releases the bolt p' immediately after the release of the drum 20 in order that it can fly back and again lock the drum 20.

The described apparatus operates as follows:—Assuming that the switch lever 2 (Figs. 6 and 8) is in its left-hand position, its pairs of springs 5 and 5' bridge the contact pieces 8, 9 and 10, 11. The current is therefore able to traverse the coil of the electromagnet 4 when the feed-limiting con-

tact 19 is closed. This contact is closed by the driver *s* (Figs. 5 and 9) resting on the linoleum as soon as it abuts against the contact 19 when the linoleum is drawn forward. The bridging of the contact pieces 10, 11 by the pair of springs 5' brings about the connection in circuit of the automatic starter *b*, whereby the motor *c* is started while the magnet *q* simultaneously releases the brake *r*. The motor *c* can, however, start only when the weighted lever 17' arranged in front of the hydraulic press *x* is lifted and closes the contact 17 and, also, only when the frame *y* by lifting the weighted lever 18' has closed the contact 18. The latter contact is a special means of security to prevent the motor *c* from being started, if the frame *y* together with templates resting on it after having been filled with linoleum is not lifted from the part of the length of linoleum having been just prepared to be drawn under the press. Owing to the motor *c* being driven the feed rolls *i* are driven through the medium of the transmission *e*, *f*, *g*, *h* and the length of linoleum is fed under the press *x*. The driver *s* is placed back on the linoleum a distance equal to that which the linoleum is to be fed forward. When the required length of linoleum has been pulled under the press the driver *s* abuts against the contact piece 19 and closes its circuit, so that the electromagnet 4 is energized and pulls the switch lever 2 over into its right-hand position. Consequently, the connection between the contact pieces 8, 9 and 10, 11 is broken and instead thereof the contact pieces 12, 13 and 14, 15 are respectively connected together. The electromagnet 4 is deenergized, the brake *r* is applied as the magnet *q* becomes currentless, and the automatic starter *b* stops the motor *c*. Owing to the contact pieces 14 and 15 being connected the auxiliary motor *z* is connected in circuit and drives the shaft 31. When this motor first starts the springs 25, 26 are still resting on the contact piece of the drum 21, and consequently this motor *z* obtains current directly for the purpose of overcoming its starting moment. Owing to the shaft 31 being driven the drum 21 is also rotated until its contact piece slides away from the springs 25, 26 and stops the direct supply of current for the auxiliary motor *z*. For this motor there then remains open only the circuit over the lamp-resistance *w*, so that the speed of this motor is slowed corresponding to the number of lamps in the circuit for the time being. Obviously, by varying the resistance and with it the speed of the auxiliary motor *z*, as well as of the drums 20, 21, 22, the time between the stoppage and restarting of the motor *c* can be varied as desired. Instead of a lamp-resistance any other kind of resistance may, of course, be employed.

When the driver *s* has fulfilled its object, namely actuating the contact 19, it is placed by hand back a distance equal to the next length of the feed, in order that when the linoleum is next drawn forward it can operate afresh. 70

I claim:—

1. In apparatus for feeding a web carrying linoleum into a press, the combination with a conveyer belt for feeding the web, a feed roll for driving the said belt, gearing for driving said feed roll, and an electric motor for driving said gearing, of an automatic starter for switching the motor into circuit, and electromagnetically actuated means for closing and breaking the circuit of the automatic starter and stopping said motor for a predetermined time. 75

2. In apparatus for feeding a web carrying linoleum into a press, the combination with a conveyer belt for feeding the web, a feed roll for driving the said belt, gearing for driving said feed roll, and an electric motor for driving said gearing, of an automatic starter for switching the motor into circuit, and electromagnetically actuated means for closing and breaking the circuit of the automatic starter and stopping said motor for a predetermined time, said means comprising a remote control time switch, for closing the starter circuit and a contact connected with an electromagnet inducing the interruption of the starter circuit, said contact being closed by adjustable means actuated by the web feeding device. 85 90 95 100

3. In apparatus for feeding a web carrying linoleum into a press, the combination with a conveyer belt for feeding the web, a feed roll for driving the belt, gearing for driving the feed roll and an electric motor for driving said gearing, of an automatic starter for switching the motor into circuit, a switching device for controlling said automatic starter and normally connecting the same in circuit, means controlled by the belt for reversing the switching device and thereby breaking the circuit of the automatic starter and stopping said motor, and an electric remote control time switch connected into circuit by the reversed switching device for returning the switching device into its normal position. 105 110 115

4. In apparatus for feeding a web carrying linoleum into a press, the combination with a conveyer belt for feeding the web, a feed roll for driving the belt, gearing for driving the feed roll and an electric motor for driving said gearing, of an automatic starter for switching the motor into circuit, a switching device for controlling said automatic starter and normally connecting the same in circuit, means controlled by the belt for reversing the switching device and thereby breaking the circuit of the automatic starter and stopping said motor, a remote 120 125 130

control switch for returning the switching device into its normal position, and an auxiliary motor connected into circuit by the reversed switching device for actuating the remote control switch.

5. In apparatus for feeding a web carrying linoleum into a press, the combination with a conveyer belt for feeding the web, a feed roll for driving the belt, gearing for driving the feed roll and an electric motor for driving said gearing, of an automatic starter for switching the motor into circuit, a switching device for controlling said automatic starter and normally connecting the same in circuit, means controlled by the belt for reversing the switching device and thereby breaking the circuit of the automatic starter and stopping said motor, a remote control switch for returning the switching device into its normal position, and an auxiliary motor connected into circuit by the reversed switching device for actuating the remote control switch, and means for varying the speed of the auxiliary motor a predetermined amount.

6. In apparatus for feeding a web carrying linoleum into a press, the combination, with a conveyer belt for feeding the web, a feed roll for driving the belt, gearing for driving the feed roll and an electric motor for driving said gearing, of an automatic starter for switching the motor into circuit, a switching device for controlling said automatic starter and normally connecting the same in circuit, means controlled by the belt for reversing the switching device and thereby breaking the circuit of the automatic starter and stopping said motor, and an electric remote control time switch connected into circuit by the reversed switching device for returning the switching device into its normal position, a line connecting the switching device with the said starter containing two pairs of contact pieces, the one pair of contacts being adapted to be closed by the stamp of the press only when the stamp is in its elevated position and the other pair of contacts being adapted to be closed by the pattern frame of the press only when the frame is in its elevated position.

7. In apparatus for feeding a web carrying linoleum into a press, the combination with a conveyer belt for feeding the web, a feed roll for driving the belt, gearing for driving the feed roll and an electric motor for driving said gearing, of an automatic starter for switching the motor into circuit, a switching device for controlling said automatic starter and normally connecting the

same in circuit, means comprising a driver adapted to be placed at various places on the belt for reversing the switching device and thereby breaking the circuit of the automatic starter and stopping said motor, and an electric remote control time switch connected into circuit by the reversed switching device for returning the switching device into its normal position.

8. In apparatus for feeding a web carrying linoleum into a press, the combination with a conveyer belt for feeding the web, a feed roll for driving the belt, gearing for driving the feed roll and an electric motor for driving said gearing, of an automatic starter for switching the motor into circuit, a switching device for controlling said automatic starter and normally connecting the same in circuit, means controlled by the belt for reversing the switching device and thereby breaking the circuit of the automatic starter and stopping said motor, a remote control switch for returning the switching device into its normal position, and an auxiliary motor connected into circuit by the reversed switching device for actuating the remote control switch, and a variable resistance adapted to be connected in series with the auxiliary motor by the said remote control switch after the auxiliary motor has started.

9. In apparatus for feeding a web carrying linoleum into a press, the combination with a conveyer belt for feeding the web, a feed roll for driving the belt, gearing for driving the feed roll and an electric motor for driving said gearing, of an automatic starter for switching the motor into circuit, a switching device for controlling said automatic starter and normally connecting the same in circuit, means controlled by the belt for reversing the switching device and thereby breaking the circuit of the automatic starter and stopping said motor, a remote control switch for returning the switching device into its normal position, and an auxiliary motor connected into circuit by the reversed switching device for actuating the remote control switch, and an electric bell adapted to be connected in circuit by the said remote control switch shortly before the said switching device is returned into its normal position.

In testimony whereof, I affix my signature in the presence of two witnesses.

FRIEDRICH WILKENS.

Witnesses:

FREDERICK HOYERMANN,
WILHELM STRUPS.