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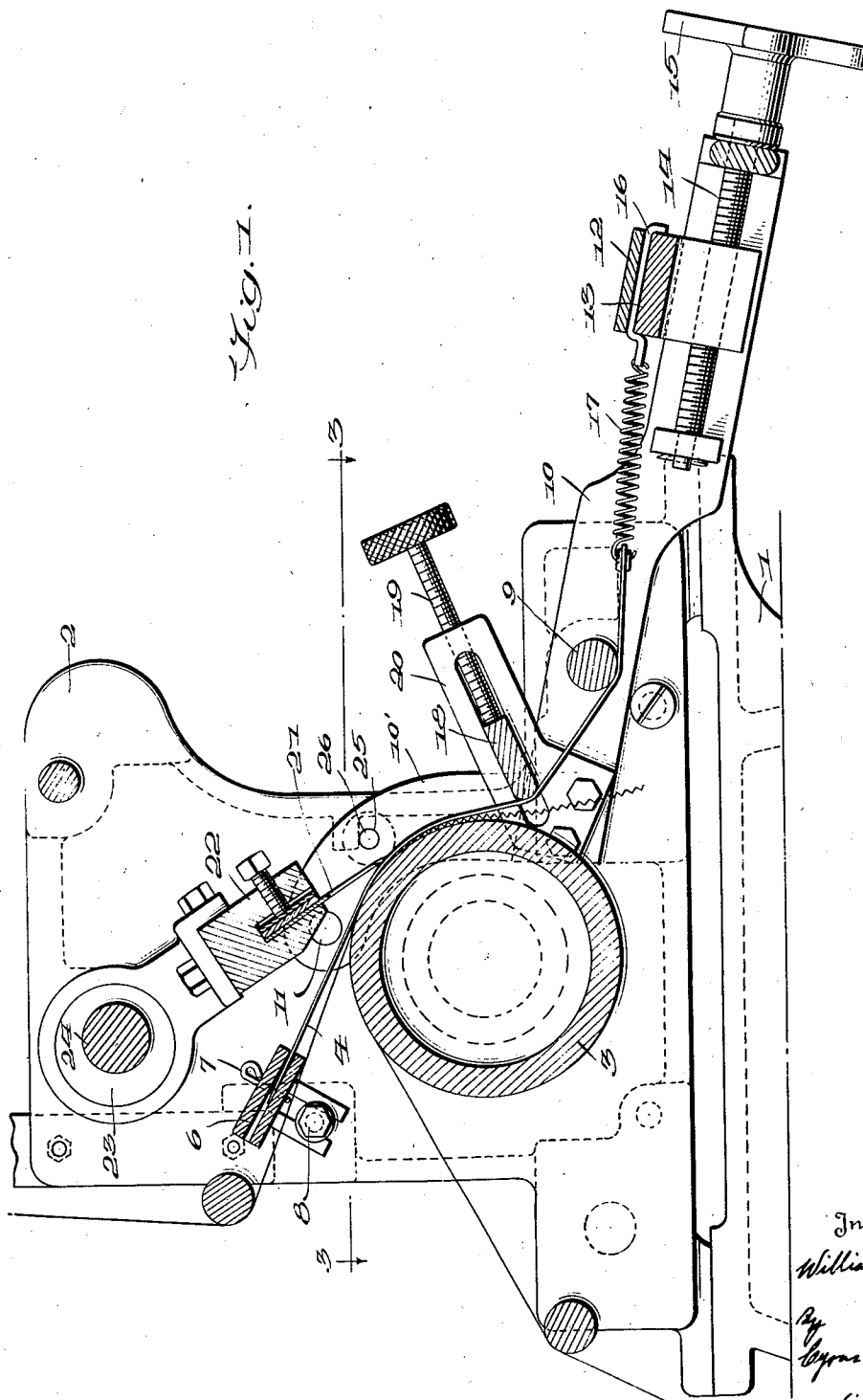
W. T. MAXANT

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PLAITING MACHINE

Filed July 16, 1936

7 Sheets-Sheet 1



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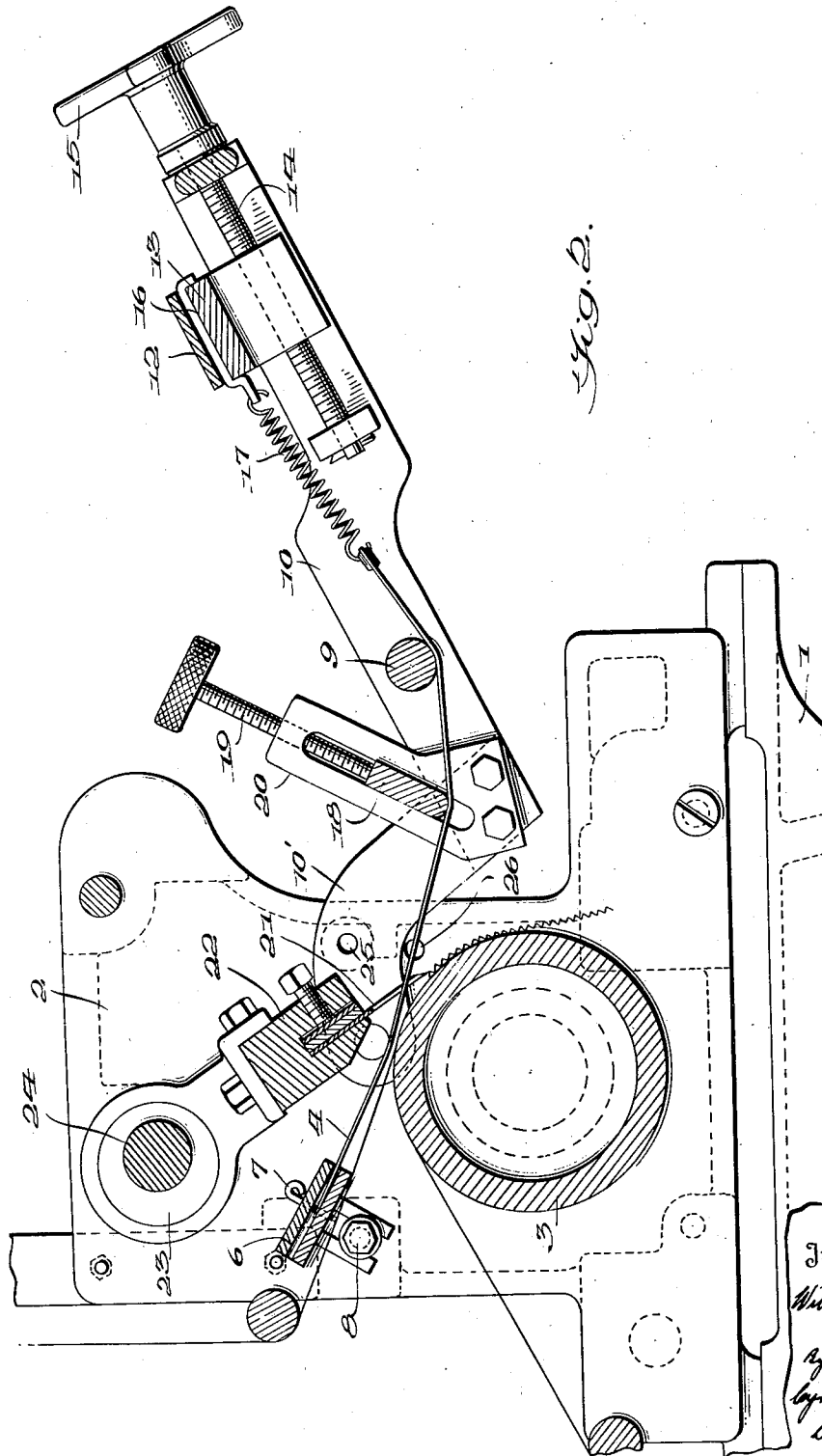
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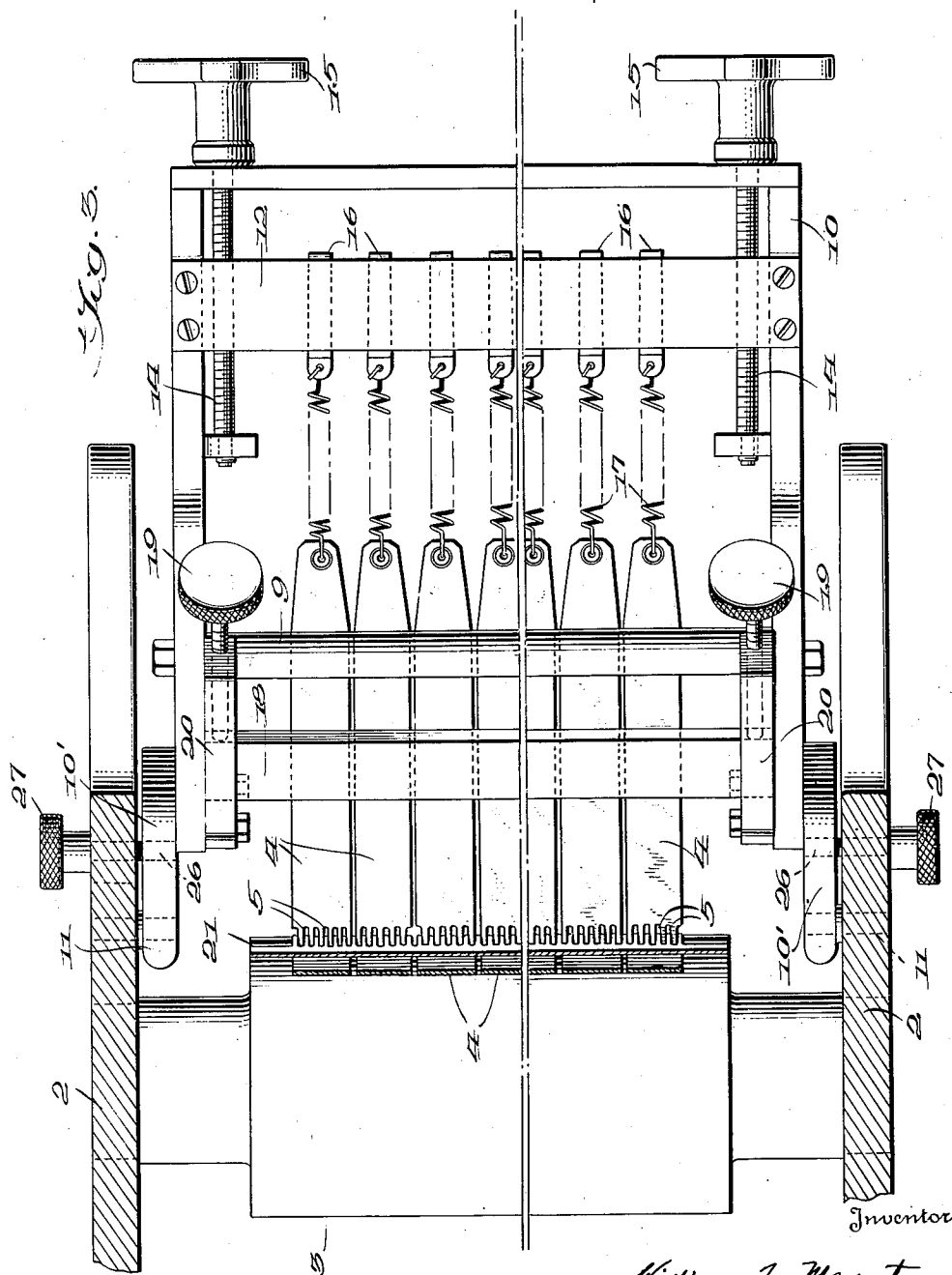
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PLAITING MACHINE

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7 Sheets-Sheet 3



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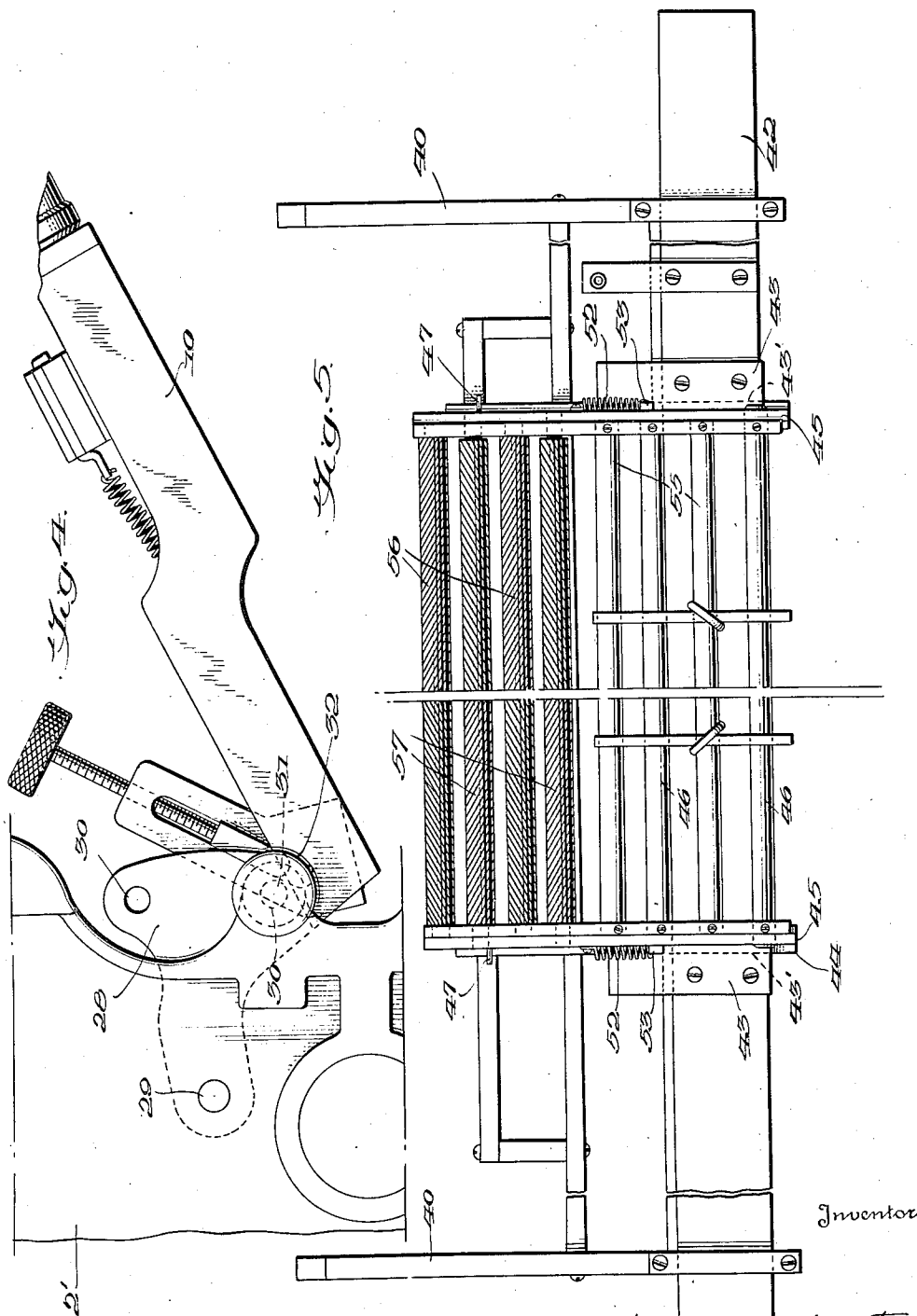
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PLAITING MACHINE

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7 Sheets-Sheet 4



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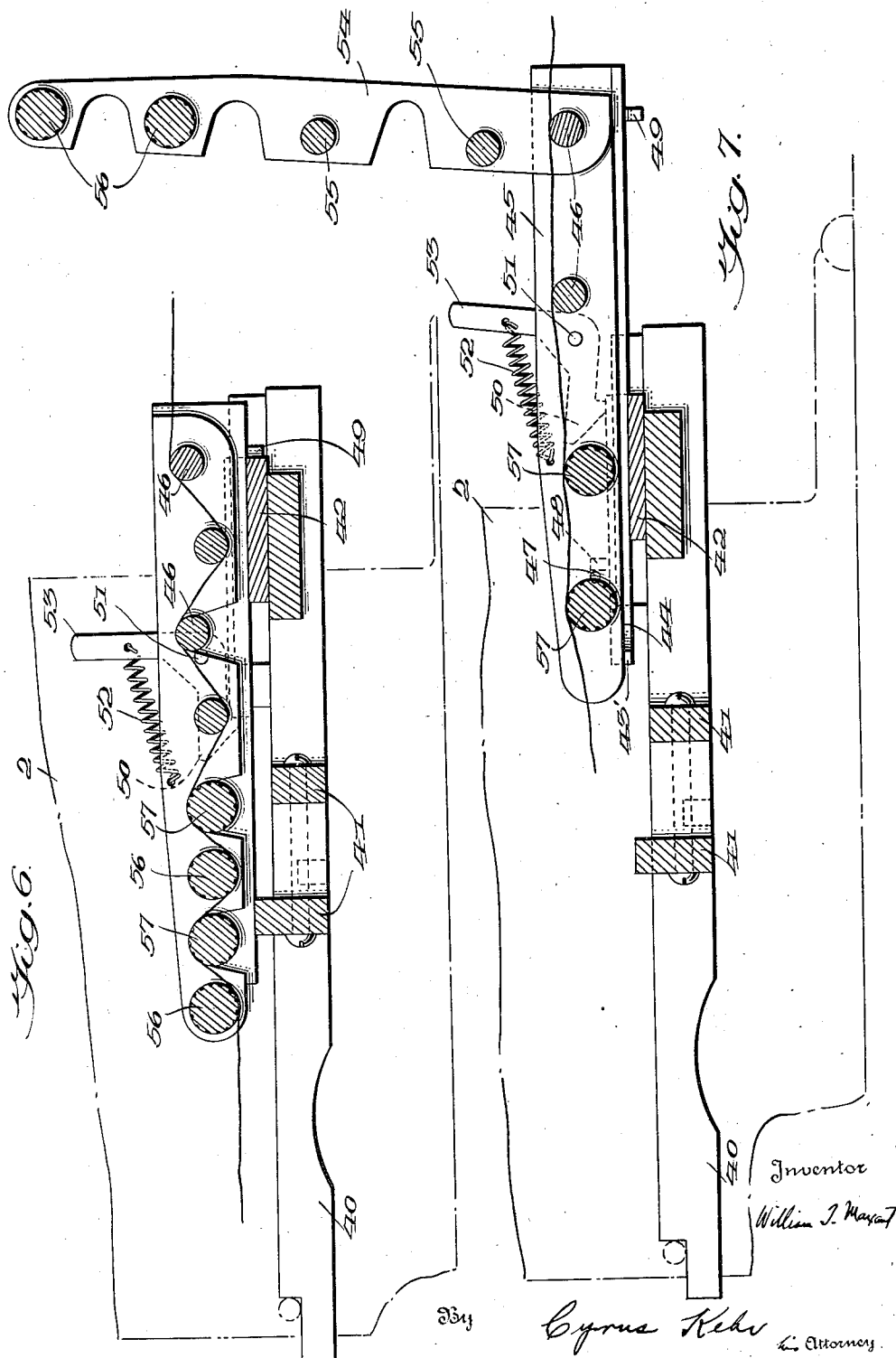
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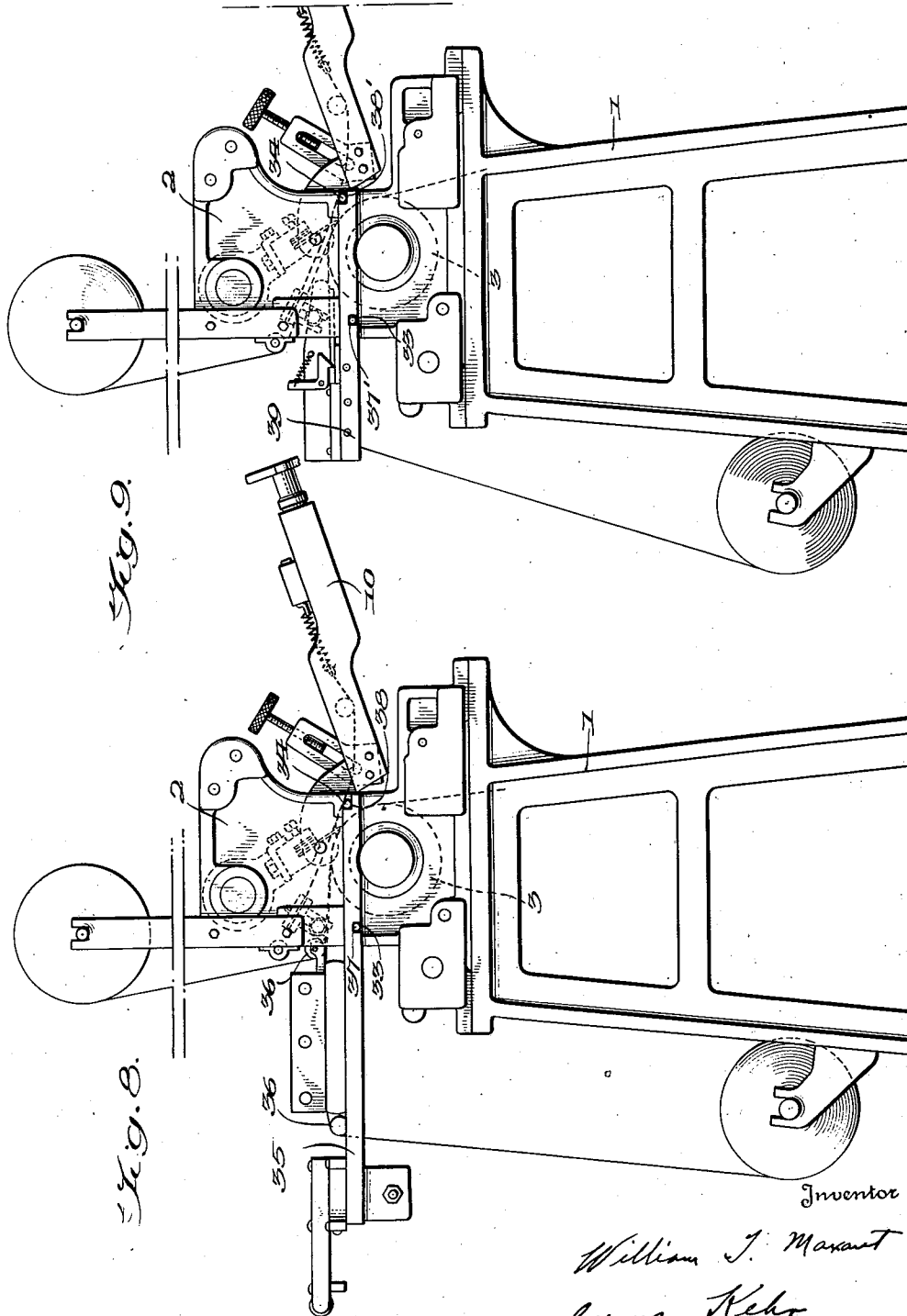


Fig. 9.

Fig. 8.

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Fig. 11.

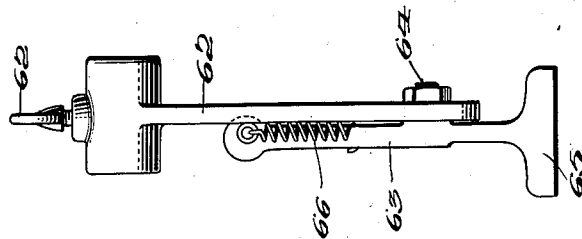
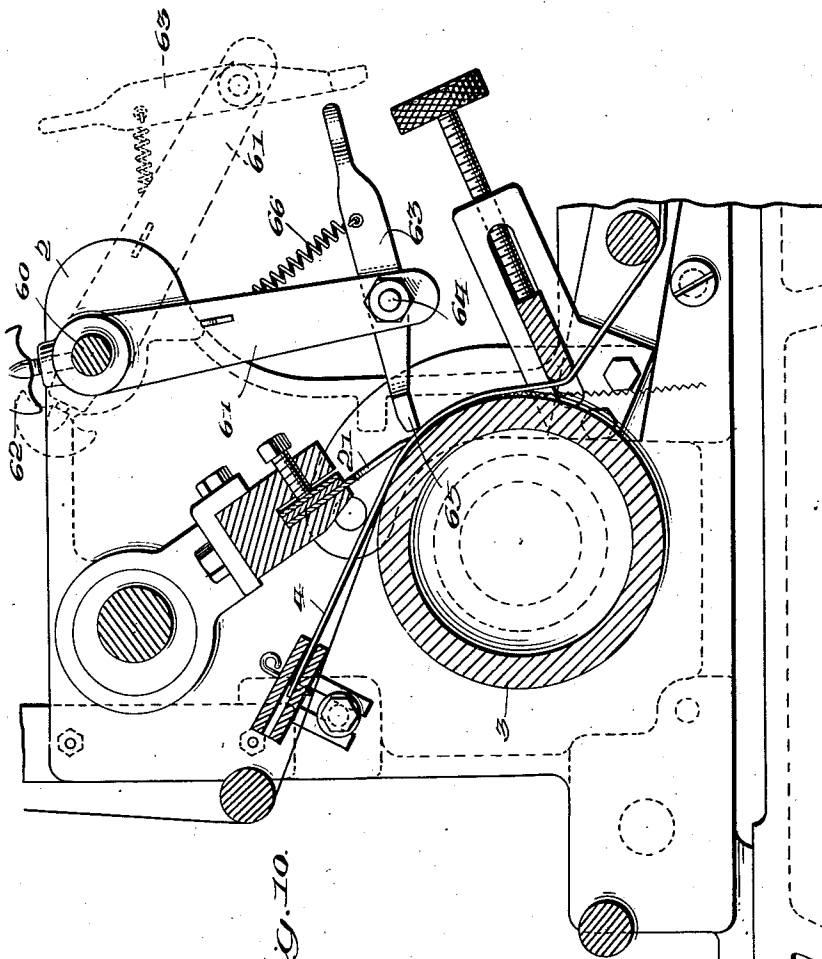


Fig. 10.

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UNITED STATES PATENT OFFICE

2,289,290

PLAITING MACHINE

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Application July 16, 1936, Serial No. 91,013

25 Claims. (Cl. 223—30)

This invention relates to an improvement in plaiting machines of the type designed to form small upright plaits in paper or fabric in the nature of fine accordion or scallop plaiting, or the like.

The object of this invention is to improve the plaiting machine of this character to enable it to perform its work more satisfactorily, to be changed from one type to another readily, and to facilitate the feeding of the paper and fabric to the machine. These and other objects of the invention will be apparent from the following description.

One of the improved features in this invention is the provision of bands under tension provided with means for adjusting the tension of the bands to vary the pressure on the bands, and provision is made for adjusting the bands laterally, as well as longitudinally, so as to keep them in proper alignment and position. Provision is also made for releasing the pressure on the bands without actually disconnecting them, when it is necessary to feed paper or fabric into the machine, thereby simplifying and expediting the feeding of the machine.

Another feature of the present invention is the provision of a carriage having rollers knurled or spirally grooved in opposite directions, so as to iron out any wrinkles in the material and also to prevent any buckling or folding over of the material. This feature of the invention also includes a hinged frame carrying some of these rollers so that it may be opened for easy and simple threading of the material through the rollers, and when closed will give the required tension to the material. Provision is also made in this carriage for movement thereof away from the machine for threading the material there-through, after which it may be pushed forward and locked in its forward position.

Still another feature of this invention is the provision of pin and notch connections between the table and frame of the machine which permits ready and easy substitution of one type of table for another, either of which may be easily and quickly attached to or detached from the machine without the necessity of using bolts or screws, as has been necessary heretofore.

These and other features are set forth fully and clearly in the accompanying drawings, in which:

Fig. 1 is a longitudinal vertical sectional view through the midportion of the machine;

Fig. 2 is a similar view, showing the band frame raised out of its operative position;

Fig. 3 is a horizontal sectional view, substantially on the line 3—3, of Fig. 1;

Fig. 4 is a detailed side elevation of a similar portion of the machine, showing a slight modification of the band frame;

Fig. 5 is a top plan view of the improved table, detached and partly broken away;

Fig. 6 is a longitudinal sectional view there-through;

Fig. 7 is a similar view with the carriage open for threading of the fabric;

Fig. 8 is a side elevation of the complete machine, showing the table used for accordion plaiting;

Fig. 9 is a similar view showing the table in place;

Fig. 10 is a longitudinal vertical sectional view through a portion of the machine, partly in elevation, showing a pressure attachment; and

Fig. 11 is a side elevation of said attachment.

Referring to Figs. 1, 2, and 3 of the drawings, the machine has a supporting base portion including legs, which is designated generally by the numeral 1, and which carry side plates 2 in which a roller 3 is held fixed.

Extending transversely over the roller 3 are a plurality of bands 4, each of which is preferably in the form of a flexible steel strap and is slotted as shown at 5 in Fig. 3, to receive the teeth of a comb, as shown in Figs. 1, 2, and 3. Each band 4 has one end received in a clamp 6, where it is held by a pin 7 extending through the clamp and through the adjacent end of the band 4. The clamp extends transversely of the machine and is adjustably secured to the side plates 2 by bolts or screws 8.

The bands extend from the clamp 6 transversely over the roller 3 and under a guide rod 9, which rod 9 extends transversely of a frame 10, the sides of which have offset brackets 10' which are pivoted at 11 to the side plates 2, for vertical swinging of the frame 10 relative thereto.

The opposite sides of the frame 10 have a transverse bar 12 secured thereto at its ends, and mounted beneath the bar 12 is a bar 13 parallel therewith but slightly spaced therefrom. The bar 13 is carried at its opposite ends on adjusting screws 14 journaled in the frame 10 and provided with hand wheels 15, for turning the same so as to move the bar 13 forwardly or backwardly relative to the frame 10 and the bar 12. Loosely mounted between the bars 12 and 13 are a plurality of hook-straps 16, having portions turned downwardly on opposite sides of the bar 13 so as

to be held thereby, but the looseness of these straps 16 permits them to slide freely lengthwise of the bars 12 and 13 for adjusting themselves and the bands 4 attached thereto to their proper positions. The forward ends of the straps 16 have coil springs 17 connected therewith, which springs extend from the straps 16 to the free ends of the bands 4 for resiliently applying tension to the bands.

As a further means of pressing the bands against the periphery of the roller 3, a guide bar 18 extends transversely of the machine, as shown in Figs. 1, 2, and 3, and bears upon the outer sides of the bands 4, said guide bar 18 being adjusted by hand screws 19, threaded in brackets 20 carried by the sides of the frame 10.

The plaiting or creasing of the material is caused by a comb 21, the teeth of which operate through the slots 5 in the bands 4 to act upon the material against the periphery of the roller 3. The comb 21 is mounted in a head 22 carried by eccentrics 23 on a shaft 24, which extends transversely between the side plates 5 of the frame. The shaft 24 is driven in any desired or well-known manner.

The paper and cloth are supported in the usual manner on rollers carried by the legs and superstructure of the machine, as represented in Figs. 8 and 9, from which said materials are guided to the periphery of the roller 3. In threading or feeding the paper and cloth through the machine, it is only necessary to lift the frame 10, swinging it upon its pivots 11, in order to release the tension on the bands 4 and to raise these away from the periphery of the roller 3, so as to permit ready access for the cloth and paper between the roller 3 and the bands 4. This makes it unnecessary to disconnect the bands in order to feed the paper and cloth into the machine and greatly simplifies this operation and reduces the time required therefor.

The brackets 10' have holes 25 therein to receive pins 26 slidably mounted in the side plates 2 to hold the frame 10 in its lowered position shown in Fig. 1. Upon withdrawing the pins 26, the frame 10 may be raised to the position shown in Fig. 2, and the pins 26 then pushed in beneath the brackets 10' to hold the frame 10 in its raised position during threading of the machine. The pins 26 have knurled heads 27 for removing or inserting the same.

The adjustment of the bands and the application of tension thereto by the springs 17 makes it possible to compress the bands with as much pressure as is found necessary to obtain perfect work, merely by the adjustment of the hand wheels 15, which move the bar 13 forwardly or backward to increase or decrease the amount of pressure on the bands in a simpler and more convenient manner than has been possible heretofore and with better results. At the same time the hook-straps 16 which slide loosely between the bars 13 and 14 serve to hold the bands in proper alignment with respect to the roller 3 and comb 21, for the proper operation of the machine.

A modification of the swinging frame 10 is shown in Fig. 4 in which the frame 10 has its sides carried by castings 28 which in turn are pivoted at 29 to the frame side plates 2'. The castings 28 have vertically spaced holes 30 therein in position to receive pins 31, which have knurled heads 32 for removing or inserting the same. When the frame 10 is raised to the position shown in Fig. 4, the pins 31 are inserted into the lower holes 30 to hold the frame in this posi-

tion, and when the frame is in its lowered position, the pins 31 are inserted into the upper holes 30 to hold it in said lowered position.

Referring to Figs. 8 and 9 of the drawings, the side plates 2 of the machine are shown as provided with laterally projecting pins 33 and 34 which are horizontally spaced and also slightly spaced vertically. This arrangement of supporting pins permits the ready attachment and detachment of the respective tables which are used in connection with the machine, permitting the tables to be conveniently dropped into place without the necessity of using screws or bolts for holding them.

This plaiting machine is capable of doing different kinds of work, as for instance, the straight fine accordion plating or the scallop plaiting. With the straight fine accordion plaiting, it is necessary to have a table such as shown in Fig. 8, and which is designated generally by the numeral 35, over which the paper feeds to the feed roll 3, passing over guides 36 on the table. The table 35 is provided with a notch 37 in its under edge of each opposite side and with a notch 38 in its upper edge, which notches 37 and 38 are turned in opposite directions in position to receive, respectively, the pins 33 and 34, and engaging the table on the under and upper edges thereof. These notches, cooperating with the pins 33 and 34, serve to hold the table in place on the machine and permit it to be easily dropped into place on the pins or to be as simply removed.

When scallop plaiting is to be done on the machine, the table 35 is unhooked from the pins 33 and 34, and lifted off the machine, and a table 39 is dropped into place on the same pins 33 and 34, as shown in Fig. 9. The table 39 has notches 37' and 38' similar to the notches 37 and 38, for receiving the pins. Then the cloth is rethreaded through the table 39 and the guide bars thereon to the roller of the machine, as shown in Fig. 9.

An improvement in the construction of the table is shown in Figs. 5, 6, and 7 for simplifying and improving the manner of threading and feeding the cloth to the plaiting machine. The improved table has an under-carriage formed of side bars 40 connected together with cross bars 41 and 42. The side bars 40 of the carriage are adapted to be applied to the side plates 2 of the machine in the manner illustrated in Figs. 8 and 9 and described above.

The bar 42 is provided with transversely extending guide plates 43 having guides 43' at the inner sides thereof, which guides receive lateral projections 44 on the side members 45 of the guide frame. The projections 44 are slidably mounted in the guides 43' for movement forwardly and backwardly therein between the positions shown in Figs. 6 and 7 of the drawings. The side members 45 have pins 47 extending laterally from their forward ends in position to engage pins 48 upstanding upon the guide plates 43 of the carriage to limit the backward movement of the guide frame relative thereto. Pins 49 depend from the under edges of the side members 45 in position to engage the rearward edge of the cross bar 42 to limit the forward sliding movement of the guide frame relative to the carriage as shown in Fig. 6.

The guide frame is held normally in a forward position by catches 50 at opposite sides of the guide frame, which catches are pivoted at 51 to the side members 45 in position to hook over the ends of the guide plates 43 when the guide

frame is moved to its forward position, as shown in Fig. 6. The catches 50 are normally urged to this position by springs 52, each of which is connected between a side member 45 and the handle 53 of the catch. Upon grasping the handles 53 and raising the catches 50 away from in front of the guide plates 43, the guide frame may be moved backward from the position shown in Fig. 6, to the position shown in Fig. 7 for purposes of threading the cloth into the table. After the threading operation, by pushing the guiding frame forward, the catches 50 snap into place over the ends of the guide plates 43 and securely hold the guide frame in this position.

The side members 45 are connected together by rods 46, on one of which is pivoted frame sides 54 which are similarly connected by rods 55, so as to be raised into the position shown in Fig. 7. The pivoted-frame sides 54 carry a pair of spaced rollers 56, the peripheries of which are grooved in the same direction, but the grooves in the opposite ends of each roller are turned in opposite directions, as shown in Fig. 5. Corresponding grooved rollers 57 are mounted in the side members 45. The grooves of the rollers 57 are turned in a different direction from the grooves in the peripheries of the rollers 56. The purpose of these staggered grooves is to iron out the wrinkles in the fabric and to smooth it out from the center, thereby prevent any buckling or folding over of the material.

When it is desired to thread the cloth through the frame, the guide frame is released from the under carriage by releasing the catches 50 and moving the guide frame back from the position shown in Fig. 6 to the position shown in Fig. 7. The pivoted-frame may be raised to the position shown in Fig. 7, and the cloth laid over the grooved rollers 57 and over the rods 46, after which the pivoted frame is lowered to the position as shown in Fig. 6, which automatically threads the cloth through the rollers 56 and 57, since these rollers alternate, as is true also of the guide rods 46 and 55, thereby giving the required attention to the material and enabling the frame to be threaded with the material in a very quick and simple manner. After threading, the guide frame would be pushed forward and held in the position, shown in Fig. 6, ready for use.

Another feature of the invention is the provision of pressure attachments which may be adjusted with respect to the bands, both transversely and forwardly, which is important when localized pressure is desired. When running materials through the machine, often such materials have a hem or binding on one edge which makes the plaited section much heavier than the plain section. Being heavier, the hemmed or bound section passes through the area of compression quicker and sometimes throws the rest of the plaiting out of line causing wrinkles. There is also a tendency to raise and jam the machine, rather than to pass through freely.

In order to apply additional pressure to these localized areas, additional pressure attachments are provided, as shown in Figs. 10 and 11.

The side plates 2 carry a rod 60, which extends transversely therebetween over the bands 4, on which rod 60 is mounted one or more arms 61, each of which is held in a set position by a set screw 62, which may be unlocked for turning movement of the arm around the rod or for longitudinal adjustment thereon. Carried by the lower end of the arm 61, is a lever 63, piv-

oted to the arm at 64, and having a pressure end 65, in position to bear against the band 4, thus giving additional pressure on said band. The pressure end 65 of the lever 63 is pressed against the band 4 by means of a spring 66, which is connected between the handle end of the lever 63 and the arm 61, normally tending to pull upwardly on said handle.

Upon depressing the outer end of the lever 63, the end 65 will be raised out of contact with the band 4 and upon loosening the set screw 62, the pressure lever may be adjusted over the band under which the hem is passing and then fastened in place by the set screw and the spring 66 presses the lever sufficiently to maintain the desired additional pressure at the hem line. The adjustment of the pressure lever enables it to be moved back and forth to accommodate garments having hems of different sizes and positions. The operator can locate the point where the hem will pass through the machine increasing the lifting of the bands, and it is only necessary for him to slide the pressure attachment to the right location and tighten the set screw, in order to apply extra pressure at this point.

I claim:

1. In a plaiting machine, the combination of a roller, a plurality of bands extending over the roller for pressing material thereagainst, crimping means extending through the bands for acting on the material, springs connected with corresponding ends of the bands, and a member connected with each of said springs, said members being adjustable transversely relative to each other for proper alignment of the bands.

2. In a plaiting machine, the combination of a roller arranged to receive material thereover, a plurality of bands extending over the roller adapted to press the material thereagainst, a comb having teeth extending through the bands for acting on the material, means for anchoring one end of each of the bands, a spring connected with the opposite end of each of the bands, a support, members connected with the springs and said support for holding the adjacent ends of the bands under tension, a frame, and hand screws journaled in the frame and having threaded connections with opposite ends of said support for adjusting the same bodily toward and from the roller to vary the tension on the bands uniformly.

3. In a plaiting machine, the combination of a roller arranged to receive material thereover, a plurality of bands extending over the roller adapted to press the material thereagainst, a comb having teeth extending through the bands for acting on the material, means for anchoring one end of each of the bands, a spring connected with the opposite end of each of the bands, a support, and members connected with the springs and said support for holding the adjacent ends of the bands under tension, said members being separate from each other and movable lengthwise of the support for proper alignment of the bands.

4. In a plaiting machine, the combination of a roller arranged to receive material thereover, a plurality of bands extending over the roller adapted to press the material thereagainst, a comb having teeth extending through the bands for acting on the material, means for anchoring one end of each of the bands, a spring connected with the opposite end of each of the bands, a supporting frame having transversely extending

members spaced apart, hook-straps slidably mounted between the members for transverse adjustment longitudinally of said members and attached to the springs for holding the same.

5. In a plaiting machine, the combination of a roller arranged to receive material thereover, a plurality of bands extending over the roller adapted to press the material thereagainst, a comb having teeth extending through the bands for acting on the material, a clamp for anchoring one end of each of the bands, a spring connected with the opposite end of each of the bands, a supporting frame having transversely extending bars spaced apart, hook-straps slidably mounted between the bars for transverse adjustment longitudinally of said bars and attached to the springs for holding the same, and hand screws journaled in the frame and having threaded connections with opposite ends of the bars for adjusting the same bodily toward and from the roller.

6. In a plaiting machine, the combination of a roller, plaiting means cooperating therewith, a plurality of bands extending transversely over the roller for pressing material thereagainst, means for anchoring one end of each of the bands, a frame attached to the opposite end of each of the bands, means pivotally supporting the frame for swinging movement to raise the bands out of contact with the roller, and means for fastening the frame in different positions.

7. In a plaiting machine, the combination of a material guide, plaiting means cooperating therewith, a plurality of bands extending transversely over said guide, a frame, means mounting said frame for upward movement, the frame being connected with the bands for raising the same out of pressure engagement with the guide, and means for locking said frame in one position.

8. In a plaiting machine, the combination of a material guide, plaiting means cooperating therewith, means for pressing material against said guide, and auxiliary pressure means acting on the material pressing means comprising an arm, a lever pivotally supported by the arm and having an end in position to bear on the material pressing means, and resilient means acting on said lever.

9. In a plaiting machine, the combination of a material guide, plaiting means cooperating therewith, one or more bands extending over the guide, a frame connected with the band or bands, means mounting said frame for upward movement to release the band or bands, and means for securing the frame in an elevated position.

10. In a plaiting machine, the combination of a roller, plaiting means cooperating therewith, a plurality of bands extending transversely of said roller for pressing material thereagainst, and means connected with the corresponding end portions of the bands for jointly swinging said end portions to move the pressing portions of said bands away from the roller for feeding material therebetween.

11. In a plaiting machine, the combination of a roller, plaiting means cooperating therewith, a plurality of bands extending transversely of said roller for pressing material thereagainst, means for moving the pressing portions of said bands away from the roller for feeding material therebetween, and means for fastening said moving means in an extreme position with the pressing portions of the bands away from the roller.

12. In a plaiting machine, the combination of a roller, plaiting means cooperating therewith, a

plurality of bands extending transversely of said roller for pressing material thereagainst, means for anchoring one end of each of the bands on one side of the roller, and a movable frame connected with the opposite ends of the bands and mounted for moving the bands away from the roller to an extreme position for feeding material therebetween, and means for holding said frame in said extreme position.

13. In a plaiting machine, the combination of a roller, plaiting means cooperating therewith, a plurality of bands extending transversely of said roller for pressing material thereagainst, means for anchoring one end of each of the bands on one side of the roller, a movable frame having a transversely extending support, means connecting the other ends of the bands with said transversely extending support, and means for adjusting said support bodily lengthwise of the bands to vary the tension of the bands.

14. In a plaiting machine, the combination of a roller, plaiting means cooperating therewith, a plurality of bands extending transversely of said roller for pressing material thereagainst, means for anchoring one end of each of the bands on one side of the roller, a pivoted frame, springs connecting the other ends of the bands with said pivoted frame, and a guide bar carried by the pivoted frame and extending transversely of the bands intermediate the resilient means and the roller for tensioning the bands adjacent the roller.

15. In a plaiting machine, the combination of a roller, plaiting means cooperating therewith, a plurality of bands extending transversely of said roller for pressing material thereagainst, means for anchoring one end of each of the bands on one side of the roller, a pivoted frame, springs connecting the other ends of the bands with said pivoted frame, a guide bar carried by the pivoted frame and extending transversely of the bands intermediate the resilient means and the roller for tensioning the bands adjacent the roller, and means for adjusting said guide bar transversely of the bands for varying the tension thereof.

16. In a plaiting machine, the combination of a material guide, plaiting means cooperating therewith, a plurality of bands extending over the guide for pressing material thereagainst, means for anchoring one end of each of the bands on one side of the guide, and means connected with the opposite end portions of said plurality of bands and holding the pressing portions thereof in pressing relation on the material guide and bodily movable with respect to the material guide for swinging said pressing portions of the bands away from the material guide, whereby material may be fed therebetween.

17. In a plaiting machine, the combination of a material guide, plaiting means cooperating therewith, a plurality of bands extending over the guide for pressing material thereagainst, means for anchoring one end of each of the bands on one side of the guide, means connected with the opposite end portions of said plurality of bands and holding the pressing portions thereof in pressing relation on the material guide and bodily movable with respect to the material guide for swinging said pressing portions of the bands away from the material guide, whereby material may be fed therebetween, and means for locking said holding means in its lowered position with the bands in pressing positions.

18. A plaiting machine comprising a surface

over which material to be plaited is adapted to pass, a plaiting knife cooperating with said surface and adapted to engage said material to plait the same, a plurality of bands engaging said surface for holding the material to be plaited in contact therewith, and means for simultaneously moving said bands out of engagement with said surface to permit the material to be threaded therebetween.

19. A plaiting machine according to claim 18 in which the bands each have one end rigidly mounted and the other end swingably mounted.

20. A plaiting machine comprising a surface over which material to be plaited is adapted to pass, a plaiting knife cooperating with said surface and adapted to engage the material to plait the same, a plurality of bands engaging said surface for holding the material to be plaited in contact therewith, a pair of pivoted members and a transverse bar mounted in said pivoted members, each of said bands having one end rigidly mounted and the other end secured to the transverse bar, said bar being adapted to be swung away from said surface to disengage the bands therefrom and to permit the material to be threaded therebetween.

21. A plaiting machine comprising a surface over which material to be plaited is adapted to pass, a plaiting knife cooperating with said surface and adapted to engage the material to plait the same, a plurality of bands engaging said surface for holding the material to be plaited in contact therewith, means for tensioning said bands to engage said surface under pressure, and means for moving said bands simultaneously out of engagement with said surface to permit material to be threaded therebetween and for mov-

ing them back into engaging position without changing the adjustment of the tensioning means.

22. A plaiting machine according to claim 21, in which one end of each of the bands is rigidly mounted, and the other end is swingably mounted, and in which the tensioning means engages the bands adjacent their swingable ends and is movable away from said surface simultaneously with the bands.

23. A plaiting machine comprising a pair of frame members, a roll supported in said frame members, a plaiting knife cooperating with the surface of said roll and adapted to engage material which passes over said roll and to plait the same, a plurality of bands when in operative position engaging the surface of said roll for holding the material to be plaited in contact therewith, each of said bands having one end rigidly mounted and the other end swingably mounted, a transverse bar to which the swingable ends of such bands are secured, a pair of brackets pivoted to the frame members and in which the transverse bar is mounted, said brackets and bar being adapted to be swung upwardly to an inoperative position to disengage the bands from the surface of said roll to permit the material to be threaded therebetween.

24. A plaiting machine according to claim 23, having means for tensioning said bands, said tensioning means being mounted in said brackets and movable therewith.

25. A plaiting machine according to claim 23, having locking means for locking the brackets in operative or inoperative position.

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