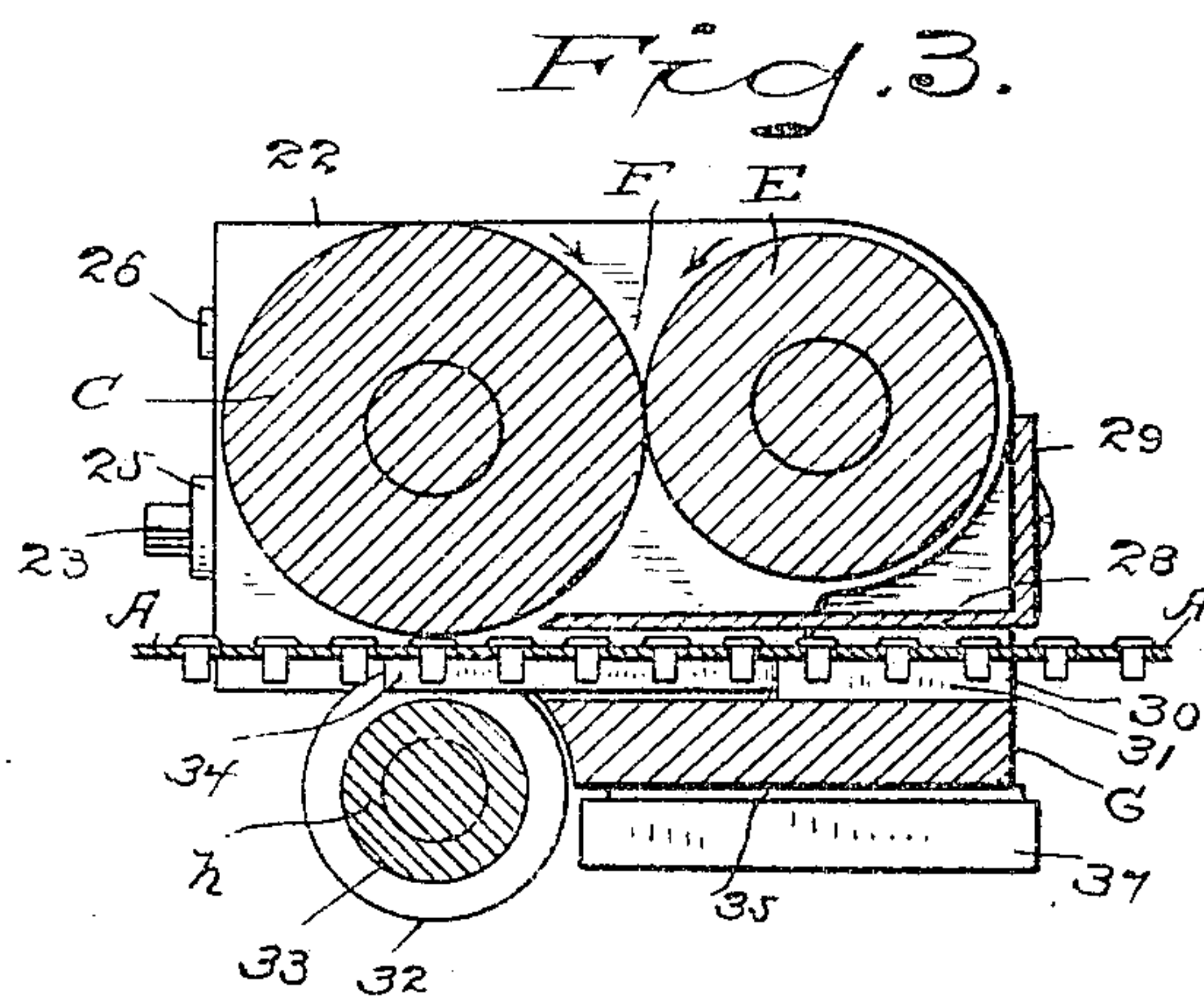
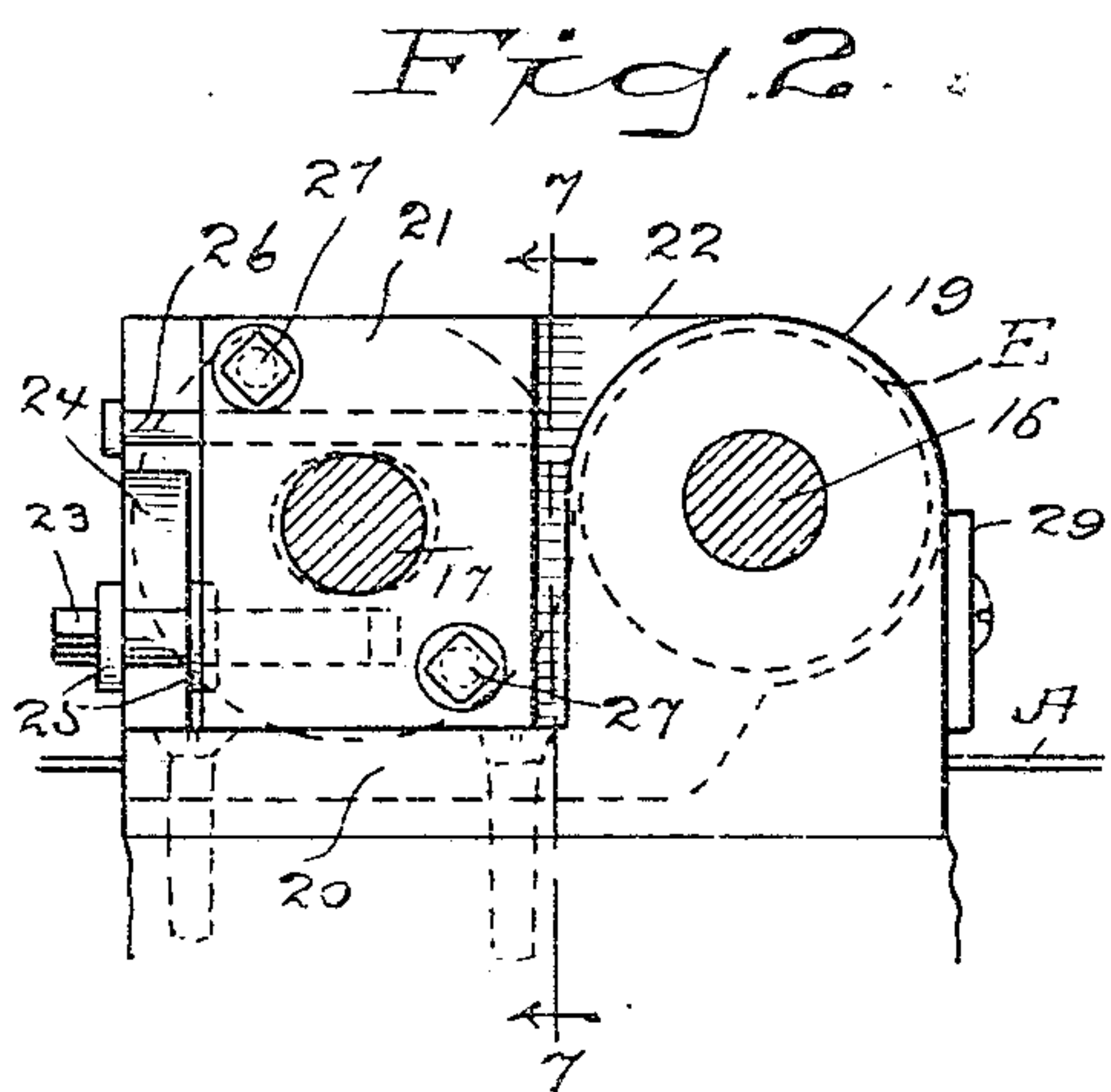
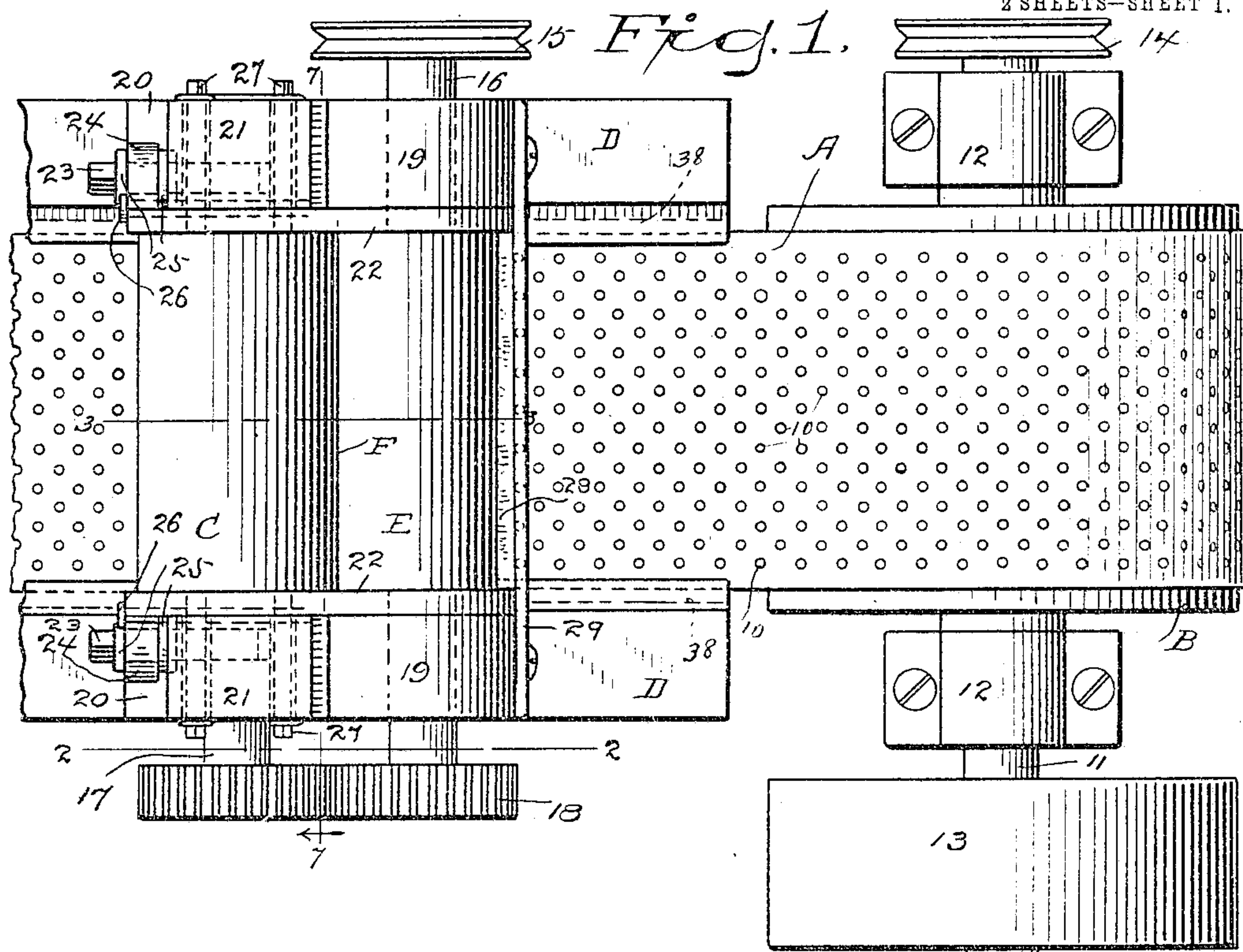


T. A. PERRINS.
MACHINE FOR JAPANNING SMALL ARTICLES.
APPLICATION FILED NOV. 18, 1904.

2 SHEETS—SHEET 1.



WITNESSES:

H. A. Lamb.
L. W. Arthur.

INVENTOR

Thomas A. Perrins

BY

A. M. Wooster

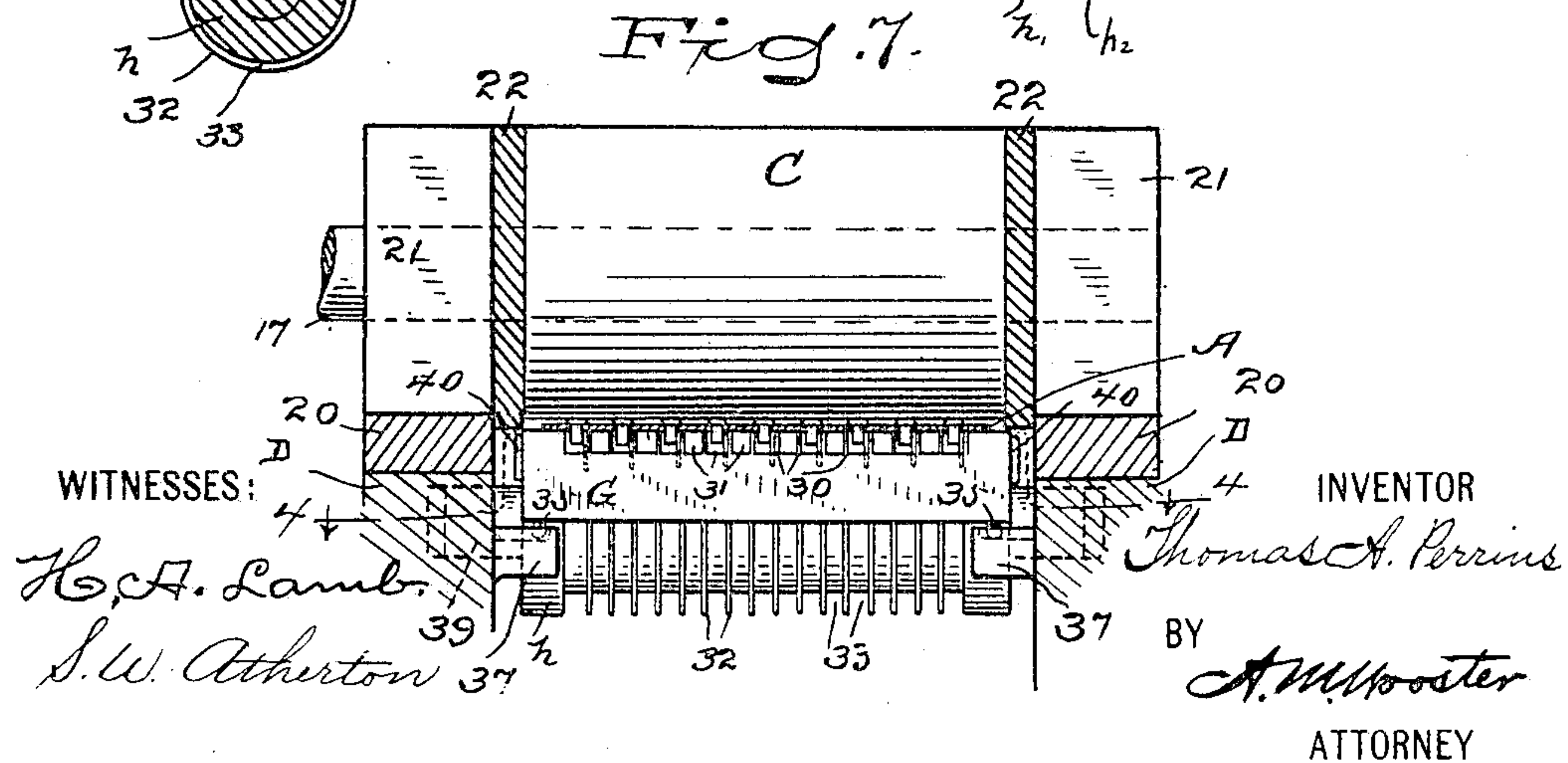
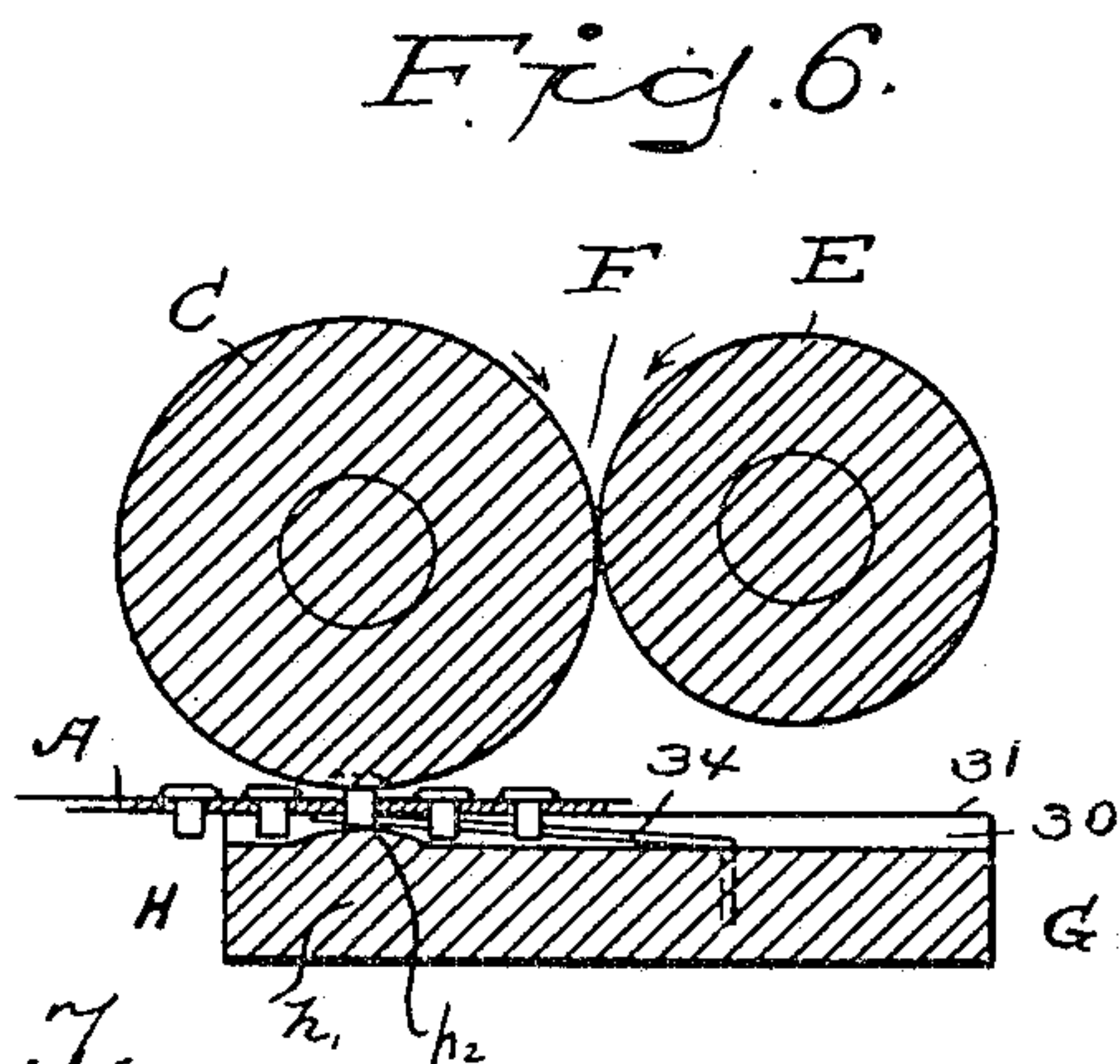
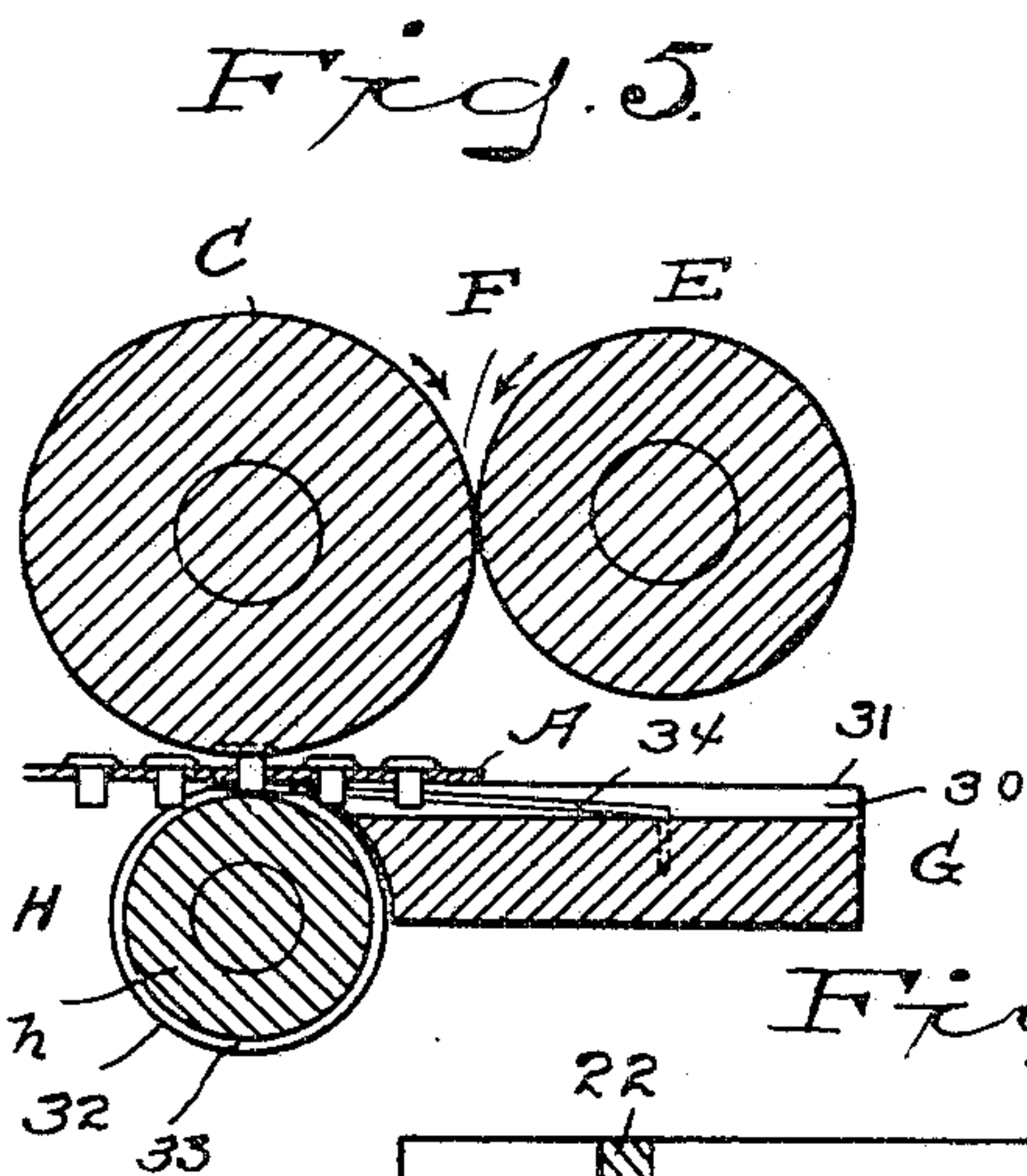
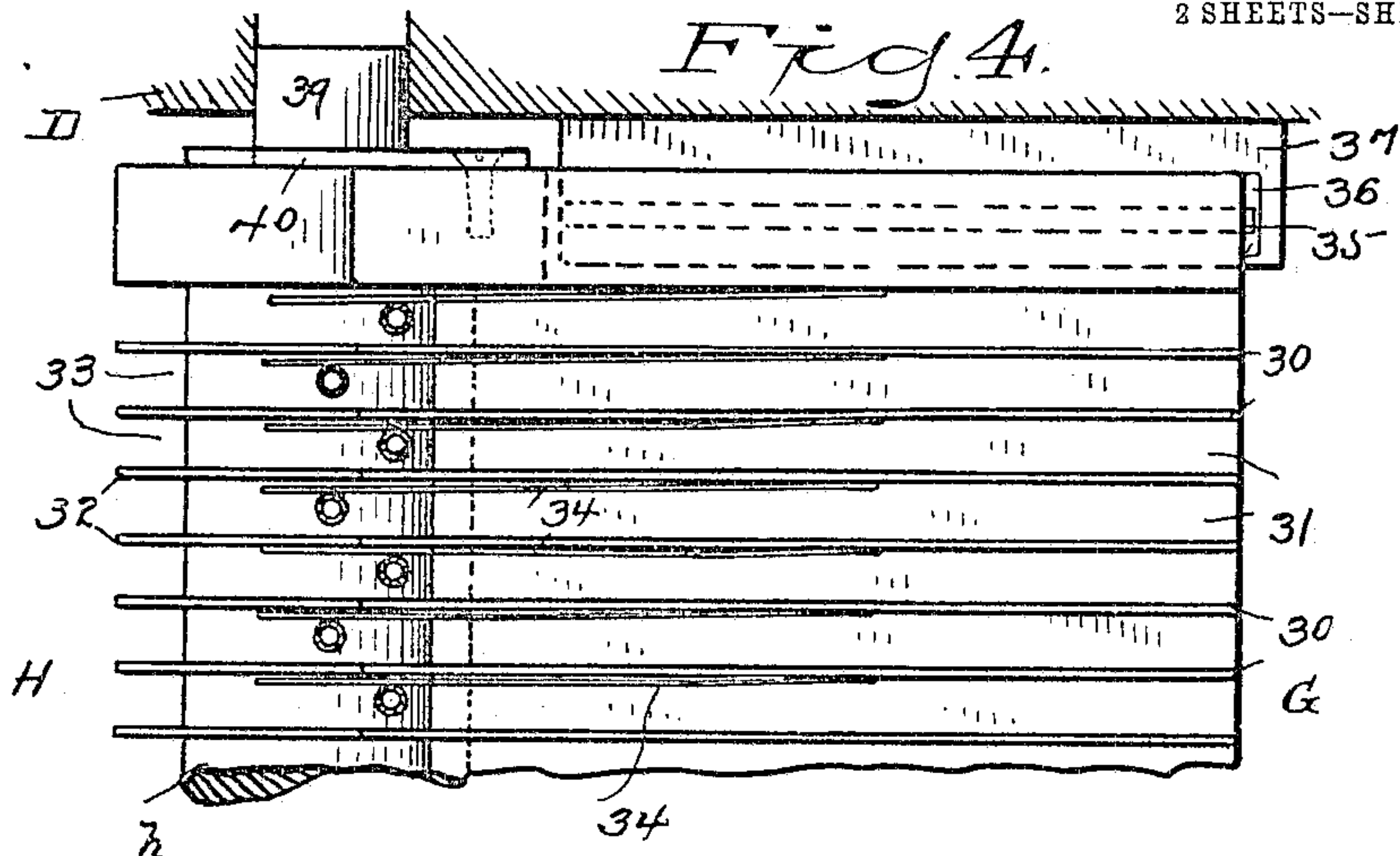
ATTORNEY

T. A. PERRINS.

MACHINE FOR JAPANNING SMALL ARTICLES.

APPLICATION FILED NOV. 18, 1904.

2 SHEETS—SHEET 2.



WITNESSES:

H. A. Lamb.

S. W. Atherton

INVENTOR

Thomas A. Perrins

BY

A. M. Hooper

ATTORNEY

UNITED STATES PATENT OFFICE.

THOMAS A. PERRINS, OF SEYMOUR, CONNECTICUT.

MACHINE FOR JAPANNING SMALL ARTICLES.

SPECIFICATION forming part of Letters Patent No. 787,213, dated April 11, 1905.

Application filed November 18, 1904. Serial No. 233,377.

To all whom it may concern:

Be it known that I, THOMAS A. PERRINS, a citizen of the United States, residing at Seymour, county of New Haven, State of Connecticut, have invented a new and useful Machine for Japanning Small Articles, of which the following is a specification.

My invention relates to machines for japanning eyelets and other small articles, and has for its general object to simplify and improve the construction in order, first, to reduce the cost of the machines, and, second, to make them easy to clean and to greatly improve their operation in use.

The class of machines to which the invention relates is illustrated and described in my former Letters Patent No. 701,386, June 3, 1902, and No. 728,606, May 19, 1903. In these machines the eyelets or other articles are carried by an endless belt having holes to receive them and are japanned, and the japan is baked thereon while they are still being carried by the belt.

It is one of the objects of this invention to produce a japanning-machine so constructed as to permit of the japan being placed upon the articles by means of a plain cylindrical roller, which may be either hard or soft, depending upon the quality of japan that is to be used.

A further object of the invention is to produce a japanning-machine in which the japan-trough shall be formed by the japanning-roller, a feed-roller, and end pieces.

A further object of the invention is to produce a japanning-machine in which the japanning-roller shall be adapted to move vertically, so as to prevent injury to either the japanning-roller or the carrying-belt should an eyelet or other article be inverted or in any way misplaced in the carrying-belt.

A further object of the invention is to produce a japanning-machine in which the eyelets or other articles to be operated upon shall be held in contact with the japanning-roller by a rest having ribs which support the belt and channels in which the eyelets lie and which in the form in which a soft japanning-roller is used are constructed to raise the eyelets into close engagement with the roller.

A further object of the invention is to provide a japanning-machine in which the carrying-belt shall rest upon a supporting-plate provided with grooves to receive the lower end of the eyelets and with retaining-springs by which the articles are held against removal from the belt by the japanning-roller.

A further object of the invention is to produce a japanning-machine in which an endless metallic carrying-belt shall rest upon a supporting-plate free to move laterally in either direction, so as to be self-adjusting to slight inequalities in the belt, thereby minimizing friction between articles carried by the belt and the supporting-plate, lessening the power required to run the machine, and greatly increasing the durability of the belt and causing it to run smoothly at all times.

With these and other objects in view the invention consists in certain constructions and in certain parts, improvements, and combinations, which will be hereinafter described and then specifically pointed out in the claims hereunto appended.

In the accompanying drawings, forming a part of this specification, in which like characters of reference indicate the same parts, Figure 1 is a plan view of one end of a japanning-machine, illustrating the subject-matter of my present invention; Fig. 2, a section on the line 2 2 in Fig. 1, showing one of the adjustable bearings of the japanning-roller; Fig. 3, a section on the line 3 3 in Fig. 1; Fig. 4, a section on a greatly-enlarged scale on the line 4 4 in Fig. 7, showing the grooved supporting-plate, retaining-springs, and grooved rest in plan; Fig. 5, a section of the japanning-roller, the feed-roller, and the guide-plate corresponding with Fig. 3, but showing a modification of the rest to adapt it for use with a soft japanning-roller; Fig. 6, a similar section illustrating a modified form in which the roller-rest is dispensed with and the belt is supported at its point of contact with the japanning-roller by means of a grooved rest which is a continuation of the supporting-plate; and Fig. 7 is a vertical section on the line 7 7 in Figs. 1 and 2, showing the japanning-roller, supporting-plate, and one form of roller-rest in elevation.

Referring to the drawings, A denotes an endless metallic carrying-belt having holes or perforations 10 to adapt it to receive small articles, as eyelets, and B a pulley over which one end of the carrying-belt passes. This pulley is shown as carried by a shaft 11, journaled in bearings 12 and having a belt-pulley 13, over which a driving-belt (not shown) passes. At the other end of shaft 11 is a smaller belt-pulley 14, from which a belt (not shown) extends to a similar belt-pulley 15 on the shaft 16 of a roller E, which for convenience I will term the "feed-roller."

C denotes the japanning-roller, which is carried by a shaft 17. The ends of shafts 16 and 17 opposite to belt-pulley 15 are provided with intermeshing gear-wheels 18 of the same size. The shaft 16 of the feed-roller is journaled in boxes 19, which are provided with extensions 20, said boxes and extensions being rigidly secured to the framework of the machine, which as a whole I have indicated by D. The shaft 17 of the japanning-roller is journaled in boxes 21, which are adjustably secured to end plates 22. The rear ends of these end plates are pivoted on feed-roller shaft 16 and lie closely in contact with the ends of the feed-roller and japanning-roller. The space between the upper portion of the feed-roller and japanning-roller and the end plates comprises the japan-trough, which I have indicated by F. In practice the machine is so speeded as to give to the japanning-roller a surface speed just equal to the speed at which the carrying-belt is moving forward. It will be noted that the feed-roller is smaller than the japanning-roller, and consequently has a slightly slower surface speed, the effect of which is to insure an even distribution of the japan upon the japanning-roller. In practice the japanning-roller is so adjusted relatively to the feed-roller as to permit a sufficient quantity of japan to pass onto the japanning-roller below the point of contiguity of said roller with the japanning-roller to japan the articles upon the carrying-belt. The adjustment of boxes 21, in which the japanning-roller shaft is journaled, is effected by means of bolts 23, which turn freely in bosses 24, projecting from the end plates, are held against endwise movement therein by collars 25, and are threaded to engage the boxes, so that rotation of the bolts will move the boxes, carrying with them the japanning-roller toward or from the feed-roller, as may be required. In order to insure the perfect alinement of boxes 21 in changing the adjustment, I provide guide-pins 26, which are socketed accurately half in end plates 22 and half in the boxes, as clearly shown in Fig. 1, said guide-pins being provided with heads which engage the outer ends of the end pieces. After adjustment the boxes are locked in place by being clamped to the end pieces by means of bolts 27, which pass through elongated openings in

the boxes and engage the end plates, as clearly shown in Fig. 1. It will be noted in Fig. 2 that boxes 21 normally rest upon extensions 20. Should an eyelet or other article, however, pass to the japanning-roller when inverted or in any way incorrectly seated in the carrying-belt, the end plates will simply swing on shafts 16 and permit the japanning-roller to be lifted by the incorrectly-placed eyelet or other article, so that no damage can be done either to the japanning-roller or the carrying-belt, the japanning-roller dropping back by gravity to its operative position as soon as the incorrectly-placed eyelet has passed and remaining in operative position until again raised. In order to prevent the possibility of the eyelets getting out of the holes in the carrying-belt before they reach the japanning-roller, I provide a guard-plate 28 over the carrying-belt, which extends forward from a cross-piece 29, shown as secured to boxes 19. As a support for the carrying-belt as it approaches the japanning-roller I provide a supporting-plate G, having ribs 30, which support the belt, and between the ribs channels 31, in which the lower ends of the eyelets or other articles to be japanned lie as they are carried along by the belt. In front of the supporting-plate and immediately beneath the japanning-roller I provide a rest H, having ribs 32, corresponding with ribs 30, upon which the belt rests, and between the ribs channels 33, corresponding with channels 31, in which the ends of the eyelets or other articles lie as they are carried along by the belt. This rest may be a roller *h*, journaled in the framework, as in Figs. 3, 5, and 7, or, if preferred, the rest may be an extension of the supporting-plate, as indicated by *h'* in Fig. 6, as will be more fully explained. In order to prevent the japanned eyelets from adhering to the japanning-roller and being drawn out of the holes in the carrying-belt as the surface of the japanning-roller moves upward away from the belt, I provide in channels 31 in the supporting-plate spring-retainers 34, which may be flat springs, as indicated in Fig. 3, or may be made of round wire, as in Figs. 4, 5, and 6. Either one or two spring-retainers may be provided in each channel, as preferred. In practice I have found one spring-retainer quite sufficient and have therefore illustrated the use of one retainer only in the drawings. Where two spring-retainers are used, they of course engage opposite sides of the eyelet or other article. Where one spring-retainer is used, as shown in the drawings, that retainer engages one side of the eyelet under the carrying-belt and presses the opposite side of the eyelet against the wall of the hole in the belt in which it is seated. Each eyelet is therefore retained in the belt and prevented from adhering to the japanning-roller by being pressed by the retaining-spring against one side of a hole in

the carrying-belt. The rear ends of the retaining-springs may be soldered or riveted to ribs 30, as in Fig. 4, or the rear ends of said springs may be bent at an angle and engaged in holes in the bottom of the channels, as indicated in Figs. 5 and 6.

The japanning-roller may be made of any suitable material, as metal, vulcanized fiber, or rubber, and may be hard or soft, depending upon the class of work that is to be done, and especially upon the consistency of the japan that is to be used. In using colored japan, which is usually thinner than black japan, I preferably use a relatively soft rubber japanning-roller or else a japanning-roller covered over with a layer of soft rubber.

In Fig. 3 the rest H, by which the belt and the eyelets carried thereby are supported while the tops of the eyelets are being covered with japan by the japanning-roller, is itself a roller loosely journaled in the framework just forward of the supporting-plate and having channels and ribs corresponding with the supporting-plate.

In Fig. 5 I have illustrated a roller used as a rest and especially adapted for use with a soft japanning-roller. It will be noted in Fig. 5 that the channels are much shallower than in Fig. 3, so that the eyelets at the instant of their contact with the japanning-roller are lifted up by engagement with the bottoms of the shallow channels and are slightly embedded in the soft japanning-roller, thereby insuring that the entire face of each eyelet will be covered over with japan, this form of rest being especially adapted for use when colored or any thin japan is used. If preferred, the roller may be dispensed with and the rest may be an extension of the supporting-plate, as H' in Fig. 6. Where this form of rest is used with colored or other thin japan, I preferably provide the rest with a rounded transverse rib H'' , the operation of which is to raise the eyelets slightly as they are carried over it, so as to embed them slightly in the japanning-roller, as in the other form and as clearly shown.

It will of course be understood that it is practically impossible to make a metallic carrying-belt of the great length that is required so perfect that it will run absolutely true. In order to compensate for inevitable inequalities in the carrying-belt, I so mount the supporting-plate on the framework as to leave it free to oscillate laterally, as it may tend to run in either direction, owing to inequalities. In the present instance I have shown the supporting-plate as resting upon rollers 35, lying loosely in sockets 36 in supporting-lugs 37, which extend inward from the framework. (See Figs. 3 and 7.) The edges of the belt are retained loosely in grooves 38 in the inner faces of the framework. (See Fig. 1.) The friction of the articles carried by the belt, however, upon the sides of the ribs of the

supporting-plate is reduced to the minimum, owing to the perfect freedom of the supporting-plate to move laterally in either direction as it may be impelled by the inequalities of the belt.

For ordinary use a moderately hard japanning-roller may be used and a roller h may be used as a rest, as in Fig. 3. As already stated, if a colored or any thin japan is used I preferably use a relatively soft japanning-roller and use with it, as a rest, a roller having relatively shallow channels, as in Fig. 5, or else use a form in which the roller is dispensed with and the rest is an extension of the supporting-plate and is provided with a transverse rounded rib h'' , as in Fig. 6, either of which constructions acts to raise the eyelets or other articles slightly at the instant they are in contact with the japanning-roller, so that the heads of the eyelets or other articles to be japanned are slightly embedded in the relatively soft japanning-roller, as indicated in Figs. 5 and 6, and are sure to be thoroughly coated over with the japan. Where a roller h is used as a rest for the belt at the instant the japanning operation is performed, it is of course necessary to provide for the endwise movement of said roller in conjunction with the supporting-plate. This may be accomplished by journaling said roller loosely in the framework, so that its journal, which is indicated by 39, may have free endwise movement. I have shown this roller as held in position relative to the supporting-plate, so as to move laterally therewith, by means of plates 40, rigidly secured to end plates 22 and bearing against the ends of the roller. (See Fig. 4, in which one only of said plates is shown.) Having filled the japan-trough, the operator is simply required to keep the holes in the carrying-belt supplied with eyelets or other articles, the action of the machine, with the exception of the placing of the eyelets in the holes in the belt, being wholly automatic. Should eyelets or other articles pass to the japanning-roller wrong end up or in any way improperly seated in holes in the carrying-belt, the japanning-roller will simply be lifted thereby through the swinging of end plates 22 on the shaft 16 of the feed-roller, so that no damage can be done either to the japanning-roller or to the carrying-belt and the eyelets will not be crushed, the japanning-roller simply dropping back to place by gravity the instant the improperly-seated eyelet or other article has passed.

Having thus described my invention, I claim—

1. In a machine of the character described the combination with a carrying-belt and a feed-roller, of swinging end plates and a japanning-roller journaled in said end plates.

2. In a machine of the character described the combination with a carrying-belt and a feed-roller, of a japanning-roller, swinging

end plates in which the japanning-roller is journaled whereby a feed-trough is formed by said feed-roller, japanning-roller and end plates, and means for driving said rollers.

5 3. In a machine of the character described, the combination with a carrying-belt and a feed-roller, of a japanning-roller, swinging end plates in which the japanning-roller is journaled, and means for driving the carry-
10 ing-belt and the japanning-roller at the same surface speed and means for driving the feed-roller at a slower surface speed, substantially as described, for the purpose specified.

4. In a machine of the character described
15 the combination with a carrying-belt and a feed-roller, of a japanning-roller having a smooth surface and swinging end plates in which the japanning-roller is journaled.

5. In a machine of the character described
20 the combination with a carrying-belt and a feed-roller, of a japanning-roller and a laterally-movable supporting-plate on which the carrying-belt rests.

6. In a machine of the character described
25 the combination with a carrying-belt and a feed-roller, of a japanning-roller and a laterally-movable supporting-plate having ribs on which the belt rests and intermediate said ribs channels which receive the lower ends of eye-
30 lets or other articles carried by the belt.

7. In a machine of the character described the combination with a carrying-belt and a feed-roller, of a japanning-roller, a laterally-movable supporting-plate having ribs on
35 which the belt rests and intermediate said ribs channels which receive the lower ends of eyelets or other articles carried by the belt and retaining-springs in said channels which bear against the articles carried by the belt
40 and retain them against removal by the japanning-roller.

8. In a machine of the character described the combination with a carrying-belt having holes to receive eyelets or other articles to be
45 japanned and a feed-roller, of a japanning-roller, a laterally-movable supporting-plate having ribs on which the belt rests and intermediate said ribs channels to receive the lower ends of eyelets or other articles carried by the
50 belt and a retaining-spring in each channel which bears against one side of the eyelets in said channel and presses the other side against the carrying-belt to retain them against removal by the japanning-roller.

9. In a machine of the character described the combination with a carrying-belt and a feed-roller, of a japanning-roller and a supporting-plate having ribs on which the belt
60 rests and intermediate said ribs channels to receive the lower ends of articles carried by said belt.

10. In a machine of the character described the combination with a carrying-belt and a feed-roller, of a japanning-roller, a support-
65 ing-plate having ribs on which the belt rests

and intermediate said ribs channels to receive the lower ends of articles carried by the belt and a rest under the japanning-roller which supports the belt and the articles carried there-
70 by while they are being japanned.

11. In a machine of the character described the combination with a carrying-belt and a feed-roller, of a japanning-roller, a support-
ing-plate having ribs on which the belt rests and intermediate said ribs channels to receive
75 the lower ends of articles carried by the belt and a rest under the japanning-roller which is provided with corresponding ribs and channels.

12. In a machine of the character described
80 the combination with a carrying-belt and a feed-roller, of a japanning-roller, a supporting-plate having ribs on which the belt rests and intermediate said ribs channels to receive
85 the lower ends of articles carried by the belt, a roller $\frac{1}{2}$ under the japanning-roller which supports the belt and the articles carried there-
by while they are being japanned.

13. In a machine of the character described the combination with a carrying-belt and a
90 feed-roller, of a japanning-roller, a supporting-plate having ribs on which the belt rests and intermediate said ribs channels to receive the lower ends of articles carried by the belt
95 and a transverse rest under the japanning-roller which supports the belt and slightly raises the articles carried thereby at the instant the japanning operation is performed, substantially as described, for the purpose
100 specified.

14. In a machine of the character described the combination with a carrying-belt and a feed-roller, of a japanning-roller, a support-
ing-plate having ribs on which the belt rests and intermediate said ribs channels to receive
105 the lower ends of articles carried by the belt, supporting-lugs and rollers intermediate said lugs and the supporting-plate whereby the latter is permitted to oscillate laterally on the
110 lugs.

15. In a machine of the character described the combination with a carrying-belt and a feed-roller, of a laterally-movable japanning-
roller, a supporting-plate having ribs and channels, for the purpose set forth, a loosely-
115 journaled ribbed and channeled roller under the japanning-roller and plates secured to the supporting-plate and bearing against the ends of said roller, whereby the latter is caused to move laterally with the supporting-plate.
120

16. In a machine of the character described the combination with a carrying-belt and a feed-roller, of a japanning-roller, end plates and boxes adjustably secured to the end plates
125 in which the japanning-roller is journaled.

17. In a machine of the character described the combination with a carrying-belt and framework having longitudinal grooves in its inner faces to receive the edges of the belt
loosely, of a feed-roller, swinging end plates,
130

a japanning-roller adjustably journaled in said end plates and a laterally-movable belt-supporting plate.

18. In a machine of the character described
5 the combination with a carrying-belt, frame-
work having grooves to receive said belt, and
a feed-roller, of end plates, a japanning-roller
adjustably journaled in said end plates, a lat-
erally-movable supporting-plate having ribs
10 by which the belt is supported, and interme-
diate said ribs channels to receive articles car-
ried by the belt and a similarly-grooved rest
under the japanning-roller which supports the
belt at the instant the japanning operation is
5 performed.

19. In a machine of the character described
the combination with a carrying-belt and a
feed-roller, of swinging end plates, a japan-
ning-roller adjustably journaled on said end
10 plates, and a laterally-movable supporting-
plate having ribs on which the belt rests, chan-

nels to receive the lower ends of articles car-
ried by the belt and retaining-springs in said
channels, substantially as shown, for the pur-
pose specified.

25

20. In a machine of the character described
the combination with a carrying-belt and a
feed-roller, of a japanning-roller, a support-
ing-plate having ribs on which the belt rests
and intermediate said ribs channels which re- 30
ceive the lower ends of eyelets or other arti-
cles carried by the belt and retaining-springs
in said channels which bear against the articles
carried by the belt and retain them against
removal by the japanning-roller.

35

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

THOMAS A. PERRINS.

Witnesses:

R. R. HEALEY,
GEO. A. DIVINE.