

March 7, 1939.

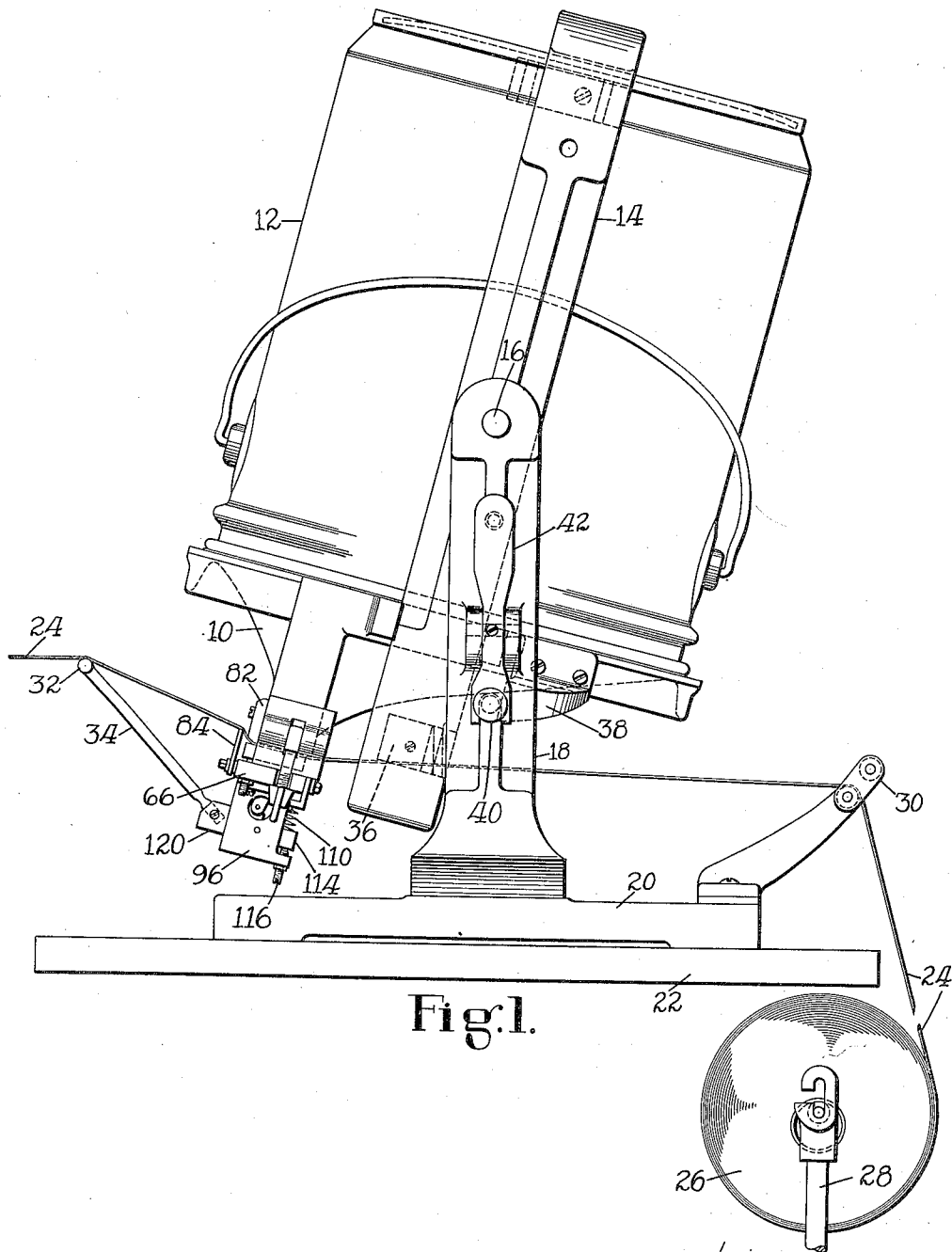
R. K. NASH

2,149,307

COATING APPARATUS FOR STRIP MATERIAL

Filed Jan. 2, 1937

2 Sheets-Sheet 1



INVENTOR-
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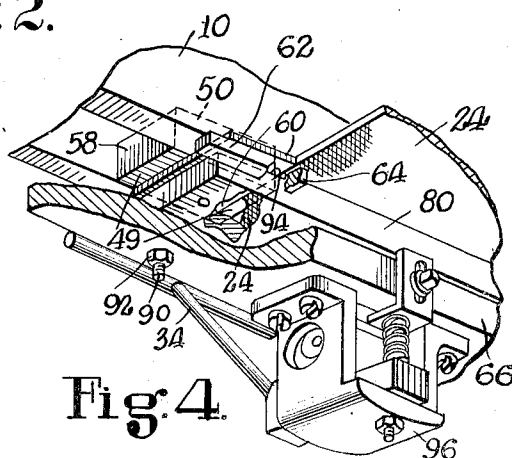
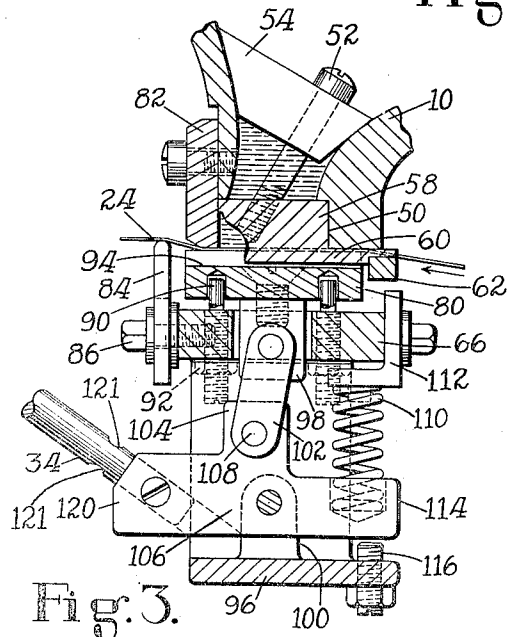
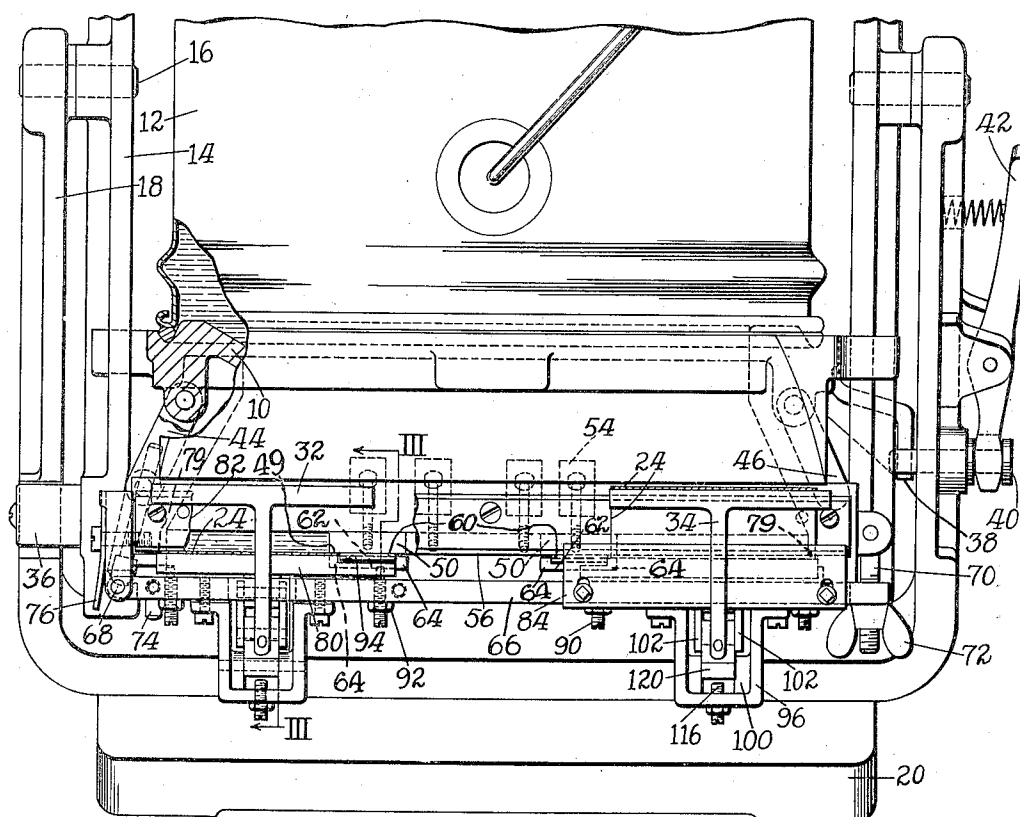
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COATING APPARATUS FOR STRIP MATERIAL

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UNITED STATES PATENT OFFICE

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COATING APPARATUS FOR STRIP MATERIAL

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Application January 2, 1937, Serial No. 118,892

10 Claims. (Cl. 91—30)

This invention relates to coating apparatus for strip material and is herein illustrated as embodied in an apparatus of the type shown in Letters Patent of the United States No. 1,898,383, granted February 21, 1933, on an application of R. K. Nash.

The apparatus of the above-mentioned patent is especially designed for applying a coating of viscous material to a strip of canvas, such as may be employed in reinforcing insoles. While eminently successful for materials of the heavy consistency for which it was designed, difficulties have been experienced when it is desired to use this type of apparatus for another type of adhesive, such as a heavy latex compound of substantially dough-like consistency. The patented apparatus is then wholly satisfactory for controlling the quantity of material applied to the strip but difficulty has been experienced when the strip is not being pulled through the apparatus because of the leakage of coating material, around the edges of the strip, for example.

An object of the invention is to provide an improved coating apparatus especially adapted to the coating of strip material and in which means are provided for stopping the above-mentioned leakage.

In accordance with this object, a novel arrangement has been provided which holds the strip tightly up against the opening of the nozzle whenever it is stationary and which may be quickly released to allow the strip to be pulled through the machine when the material is to be coated. Preferably and as shown, this controlling means is automatic and responsive to the tension applied to the strip.

These and other features of the invention will be best understood from a consideration of the following description, taken in connection with the accompanying drawings, in which

Fig. 1 is a side elevation of the apparatus;

Fig. 2 is a front elevation of the nozzle portion of the apparatus and on an enlarged scale, portions being broken away and in section;

Fig. 3 is a section, still further enlarged, on the line III—III of Fig. 2, through the nozzle and a strip being coated, and

Fig. 4 is a detail angular view showing strip-guiding devices on the nozzle.

In general, the apparatus comprises a nozzle 10 forming a cover of a can or drum 12 which is supported in a swinging frame 14 pivoted at 16 on the upstanding arms 18 of a stand 20 which may be positioned on a bench 22. Strips of canvas 24 in the form of supply rolls 26 are carried

by standards 28 which may be positioned on the floor beneath the bench. The strips are then passed between guide rolls 30, under the nozzle 10 and over the heads or crossbars 32 of T-shaped lever arms 34 to a position where the operator can apply the end of the strip to an insole (not shown) and cut off a piece of suitable length.

For a reason which will be later explained, the swinging frame 14 is held in an operative position which is inclined to the vertical. This position is determined by a bumper 36 (Figs. 1 and 2) on one side of the swinging frame and by a cam bracket 38 on the nozzle adjacent to the other side of the frame. The end of the cam bracket 38 rests against the side of a latch pin 40 slidable in an arm 18 of the stand 20, and the frame is therefore held by the bumper 36 and this cam bracket 38 against swinging movement. This pin may be manually operated by a hand lever 42 and is pushed out by the cam surface of the bracket 38 as the drum 12 is swung from upright position to the position shown in Fig. 1. As in the patented machine, the nozzle 10 constitutes a cover for the drum and is clamped tightly in position by toggles 44 and 46.

The apparatus may be arranged for a plurality of canvas strips 24 which will be of different widths in order to avoid the waste of canvas when this is applied to insoles of radically different widths. The apparatus is shown in the drawings as set up for two strips, the opening in the nozzle being divided into three parts by means of spacer blocks 50. Inasmuch as no strip of canvas is being drawn through the center third of the nozzle opening, this interval is filled by a removable filler piece 56. The spacer blocks 50 rest against the edges of the nozzle across the opening therein and are held in place by screws 52 passing through wedge-shaped blocks 54 which are positioned inside the neck of the nozzle and which bridge the nozzle opening. The filler piece 56 is also held in position by similar screws 52 and blocks 54. The spacer blocks 50 have a portion 58 which enters the neck of the nozzle and a thinner portion 60 which subtends the nozzle opening. At one end of this subtending portion 60 is a crossbar 62, the ends 64 of which extend outwardly from and are spaced below the upper surface of the portion 60 (Fig. 2). This portion 60 has a thickness approximately the same as that of the canvas strip and if the supply rolls 26 are not properly positioned with respect to the machine, the canvas strip will tend to work under the portion 60. To counteract this tendency, the strip is guided at one edge, in the case

of the outside strips and at both edges in case of a center strip, by an end 64 of the crossbar 62. As in the patented machine, the apparatus is intended to apply coating material to only the central portion of the strip, leaving a narrow uncoated margin at each edge and this action is effected at the inner edges of the outer canvas strips by margins 49 (Fig. 4) of the blocks 50 with the aid of supporting plates 80 without danger of leakage upon these margins. The outer edges of the outer canvas strips, which are shown in the drawings, are protected by the coaction of ledges 79 (Fig. 2), formed on the nozzle 10 at the ends of the nozzle opening, with the outer ends of the supporting plates 80, which hold these edges against the ledges. It will be understood that if the machine is set up for three strips, the edges of the center strip will both be guided by the adjacent ends 64 in the same manner as are the inner edges of the outer strips.

The arrangement for threading the canvas strips into the apparatus is similar to that employed in the patented machine and comprises a bridge member 66 pivoted at 68. A swinging bolt 70 and wing nut 72 are employed for clamping the free end of this bridge member and it is prevented from swinging too far outwardly by a stop pin 74 adapted to engage a plate 76. Each canvas strip passes between this bridge member 66 and the nozzle, resting on the upper surface of a supporting plate 80 and the end 64 of a crossbar 62. The quantity of material applied to the strip is determined by a stripper blade 82 mounted on the face of the nozzle and a co-operating deflector 84 vertically adjustable on the bridge member 66 and held in adjusted position by set screws 86.

Instead of having the supporting plates 80 rigidly mounted as in the patented machine, the arrangement is such that these plates are resiliently held in rest position in tight engagement with the under face of the strip 24 during intervals between strip movements and may be depressed to a predetermined limiting operating position whenever tension is applied to the strip to allow free passage of the latter through the apparatus. To this end, the plates 80 are loosely guided for up-and-down movement on pins 90 threaded in the bridge member 66 and held in adjusted position by lock nuts 92. The ends of these pins determine the working position of the plates 80. There are four of these guide pins for each of the plates and the ends of the plates are notched at 94 to underlie the portions 60 of the spacer blocks 50.

Control of the position of each of these supporting plates 80 to move them from rest position to operative position is effected by mechanism mounted in a stirrup 96 secured by screws to the under side of the bridge member 66. Attached to the plate by a screw is a depending post 98 and at the bottom of the stirrup is a pair of upstanding lugs 100. Between this post 98 and the lugs 100 is a toggle mechanism made up by parallel toggle links 102 and the upstanding arm 104 of a lever 106 which is pivoted between these lugs 100. The upstanding arm is pivotally connected to the links by a pin 108 and the toggle is normally urged to a straightened position in which the supporting plate 80 will be held firmly against the under side of the canvas strip by a spring 110 extending between a bracket 112 secured to the bridge member 66 and a socket in an arm 114 of the lever 106 which extends rearwardly or toward the incoming strip. The

spring 110 urges this lever arm 114 against a stop screw 116 locked in adjusted position in the stirrup 96. The lever also has a forwardly extending arm 120 in which is mounted the rod 34 with its strip-engaging crossbar 32. If three strips of canvas are to be employed of varying widths to accommodate different sizes of insoles, the filler piece 56 is removed and an additional strip-supporting and controlling mechanism is provided.

In using the apparatus, assuming that the drum 12 containing coating material has been positioned in the swinging frame and the nozzle 10 secured thereto in the usual manner, the canvas strips are threaded between the supporting plates 80 and the open end of the nozzle, with edges of the strips underlying the ends 64 of bars 62, and the frame swung into the position shown in Fig. 1 and locked there by the latch pin 40. When the operator is picking up a piece of work, such as an insole, or for other reasons is not drawing the canvas through the machine, then the supporting plate 80 is clamped against the under side of the canvas to press the latter upwardly to close the nozzle opening. Thus, there can be no leakage of the coating material around the edges of the strip. This clamping of the supporting plate is accomplished by the spring 110 acting through the toggle mechanism. The mechanical advantage provided by this toggle mechanism renders it unnecessary to use a very stiff spring.

When the operator pulls on the canvas strip 24 to draw it through the apparatus, this movement being in a generally horizontal direction, the strip will be tensioned over the crossbar 32 of the rod 34 and the lever 106 will be swung to break the toggle and lower the supporting plate 80, thereby rendering it easy to draw the strip through the machine. It will be understood that downward movement of the supporting plate which is needed is only a very small fraction of an inch and that the lowered position of this plate is so determined that absolute control of the quantity of coating material applied to the strip is effected by the combined action of the stripper blade 82 and the deflector 84 in the manner described in Letters Patent of the United States No. 1,771,388, granted July 22, 1930, on my application.

In order that the operator may be as little conscious as possible of the tension of the spring 110 and its associated leak-preventing mechanism, the swinging frame 14 has been locked in an inclined position, thereby increasing the angle between the bench and the arm 34 without rendering it necessary to extend the arm 34 upwardly at too abrupt an angle with respect to the nozzle mechanism. The plate 80 is lowered to an extent where it will permit the canvas strip to be drawn easily through the apparatus and this is done instantly on the application of tension to the strip without any conscious effort on the part of the operator.

It has been found that the T-shaped levers 32, 34 are apt to be grasped by the operator when the container is being inverted, as in threading a new strip through the machine. This lever offers such a mechanical advantage that rough handling of it may readily injure the toggle mechanism connected to it, especially in view of the fact that this mechanism is on the high-pressure end of the lever. To forestall such treatment, the arm 34 has been provided with a pair of notches 121 which reduce the cross

section of the arm and so weaken it that while other parts of the machine will not be affected, the arm will be broken if the operator uses it for a purpose for which it is not intended.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A coating apparatus having a nozzle for delivering coating material on the upper surface of a strip drawn beneath said nozzle, means for supporting said strip in operating position in loose engagement with the nozzle as the strip is drawn through the apparatus, means for controlling the quantity of material applied to the strip, quick-acting operator-controlled means for moving the supporting means to rest position to clamp the strip against the nozzle during intervals between strip movements thereby to prevent outflow of coating material, and means for determining the operating position of said supporting means.

2. A coating apparatus having a nozzle for delivering coating material on the upper surface of a strip drawn beneath said nozzle, means for supporting said strip in loose engagement with the nozzle, means for controlling the quantity of material applied to the strip, and means responsive to the tension of the strip threaded through the apparatus for clamping the strip against the nozzle.

3. A coating apparatus comprising an inverted container provided with a nozzle at the lower end of the container, means for guiding a strip beneath said nozzle, strip-supporting means positioned opposite said nozzle, and means for controlling the position of said supporting means comprising a strip-engaging member over which the strip is tensioned as it is drawn through the apparatus.

4. A coating apparatus having means including a nozzle for delivering coating material to the upper side of a strip drawn beneath said nozzle, a bridge member subtending said nozzle and said strip, a strip-supporting plate loosely guided for up-and-down movement between said bridge member and the nozzle, means including a toggle for moving said plate toward and away from the strip, a spring operatively connected to the toggle to raise the plate, and strip-engaging means operatively connected to the toggle to lower the plate as the strip is tensioned.

5. A coating apparatus having means including a nozzle for applying coating material to the upper side of a strip drawn beneath the nozzle, a bridge member subtending the strip, a stripper upon the nozzle adjacent to the outlet side of the opening, a deflector on the bridge member coacting with the lower side of the strip and cooperating with the stripper to control the quantity of coating material applied to the strip, a supporting plate loosely mounted on said bridge

member between it and the strip, toggle-operated means for moving said plate toward and away from the nozzle, and an arm over which the strip is tensioned connected to said toggle to break it and lower the plate when the strip is drawn through the apparatus.

6. A coating apparatus having means including a nozzle for delivering coating material to a strip drawn beneath the nozzle, a bridge member subtending the strip and having a fixed position with respect to the nozzle, a strip-supporting plate interposed between the bridge member and the nozzle, a toggle link pivotally connected to said plate, a toggle lever pivotally connected between said link and said bridge member, resilient means urging said lever in one direction, and a strip-guiding arm for moving the lever in the other direction.

7. Coating apparatus having means including a nozzle for coating a plurality of strips of material drawn beneath the nozzle, said nozzle having converging inner sides, a spacer block in the nozzle opening closing a portion of its width and separating the strips of material, said block resting against the outside of the nozzle, and means for holding said spacer wedge-shaped piece inside of and bridging the nozzle opening and resting against the converging sides.

8. A coating apparatus comprising an inverted container provided with a nozzle at the lower end of the container, means for guiding a strip beneath said nozzle, strip-supporting means positioned opposite the nozzle, and means for controlling the position of said supporting means comprising a strip-engaging lever over which the strip is tensioned as it is drawn through the apparatus, said lever having a frangible portion.

9. A coating apparatus having means including a nozzle for delivering coating material to the upper side of a strip drawn beneath said nozzle, a strip-supporting plate guided for up-and-down movement toward and away from the nozzle, means including a toggle for raising the plate to grip the strip against the nozzle, and a T-shaped lever, over the head of which the strip is drawn, connected to the toggle to lower the plate, the stem of said T-shaped lever being provided with a notch adjacent to the toggle.

10. In a coating apparatus, a frame, an inverted container pivoted in the frame and provided with a nozzle at the lower end of the container, means for guiding a strip beneath said nozzle, strip-supporting means positioned opposite the nozzle, and means for controlling the position of said supporting means comprising a projecting T-shaped lever over the head of which the strip is tensioned as it is drawn through the apparatus, said lever having a notch reducing the cross section of the stem of the lever.

RUSSELL K. NASH.

CERTIFICATE OF CORRECTION.

Patent No. 2,149,307.

March 7, 1939.

RUSSELL K. NASH.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, second column, line 26, claim 7, after the word "spacer" insert block including a; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 26th day of September, A. D. 1939.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.