June 19, 1956 A. WEISENBURG 2,750,987

PRESSER WHEEL FOR SECURING PADS TO CROWN CAPS

Filed Aug. 31, 1953 3 Sheets-Sheet 1

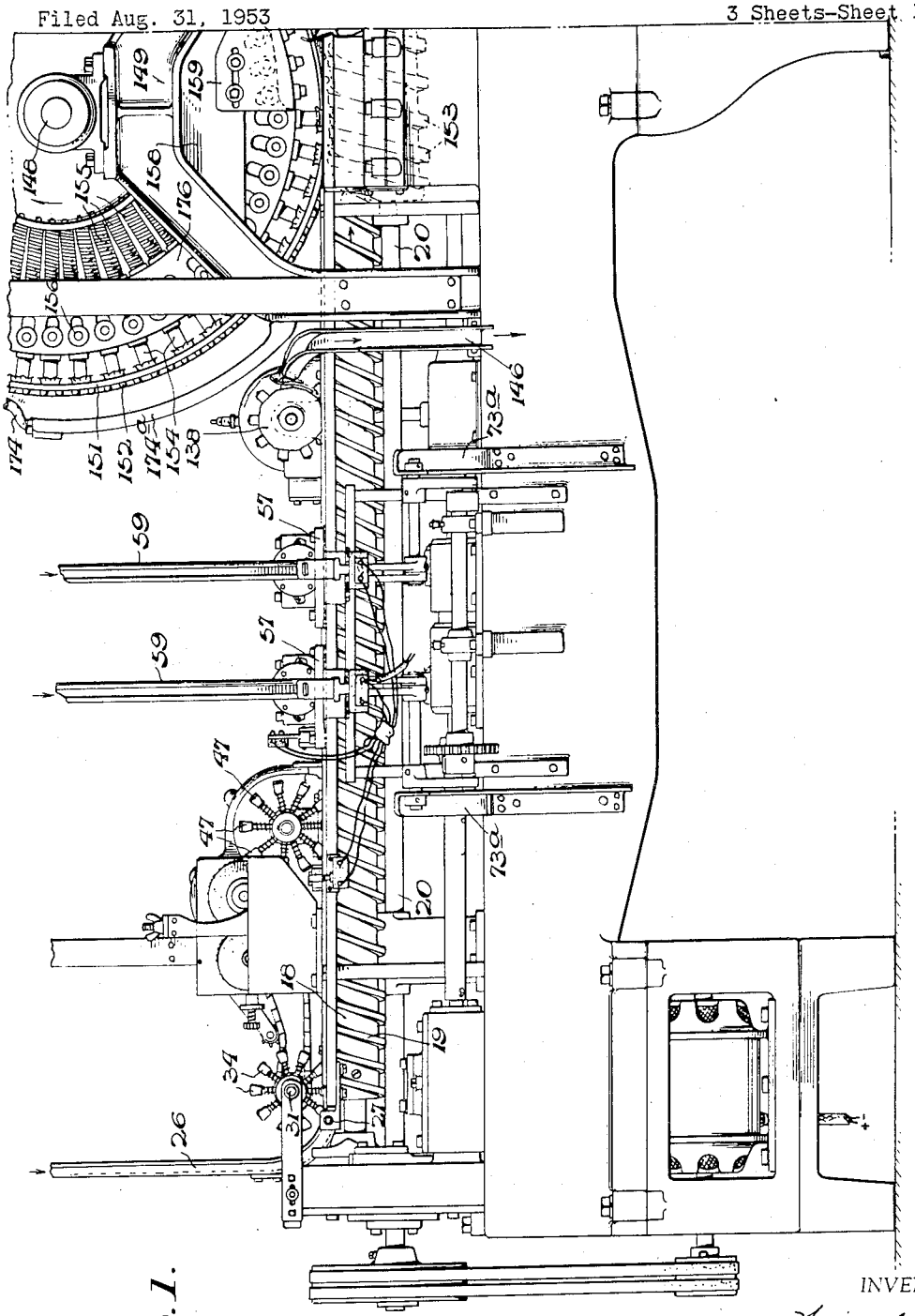


FIG. 1.

INVENTOR

Andrew Weisenburg

BY Mason, Porter, Dielewski & Stewart

ATTORNEYS

June 19, 1956 A. WEISENBURG 2,750,987

PRESSER WHEEL FOR SECURING PADS TO CROWN CAPS

Filed Aug. 31, 1953 3 Sheets-Sheet 2

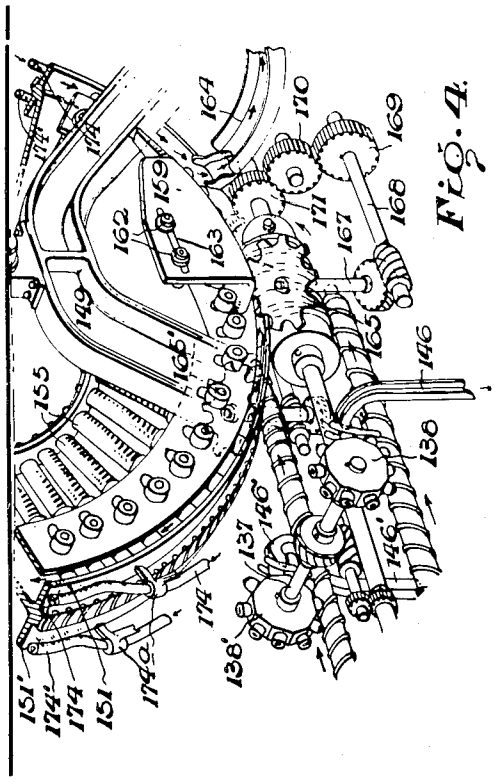


Fig. 4.

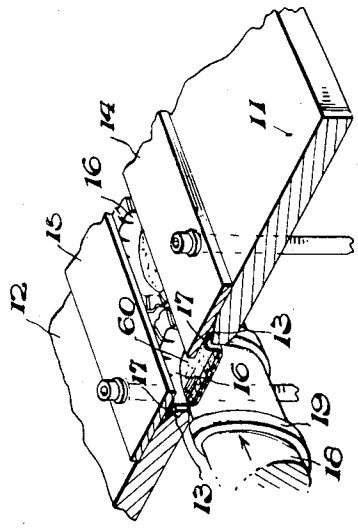


Fig. 3.

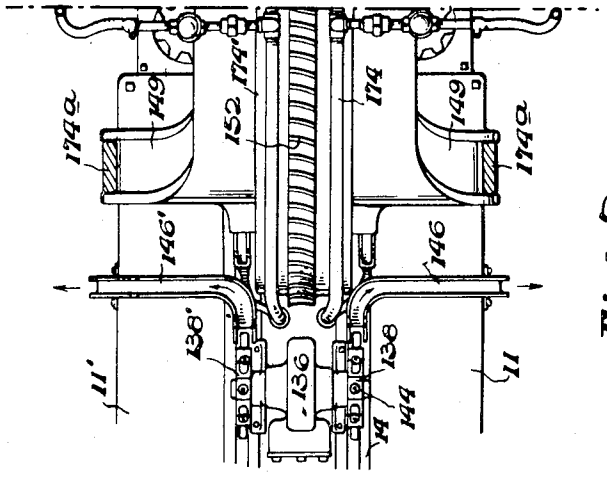


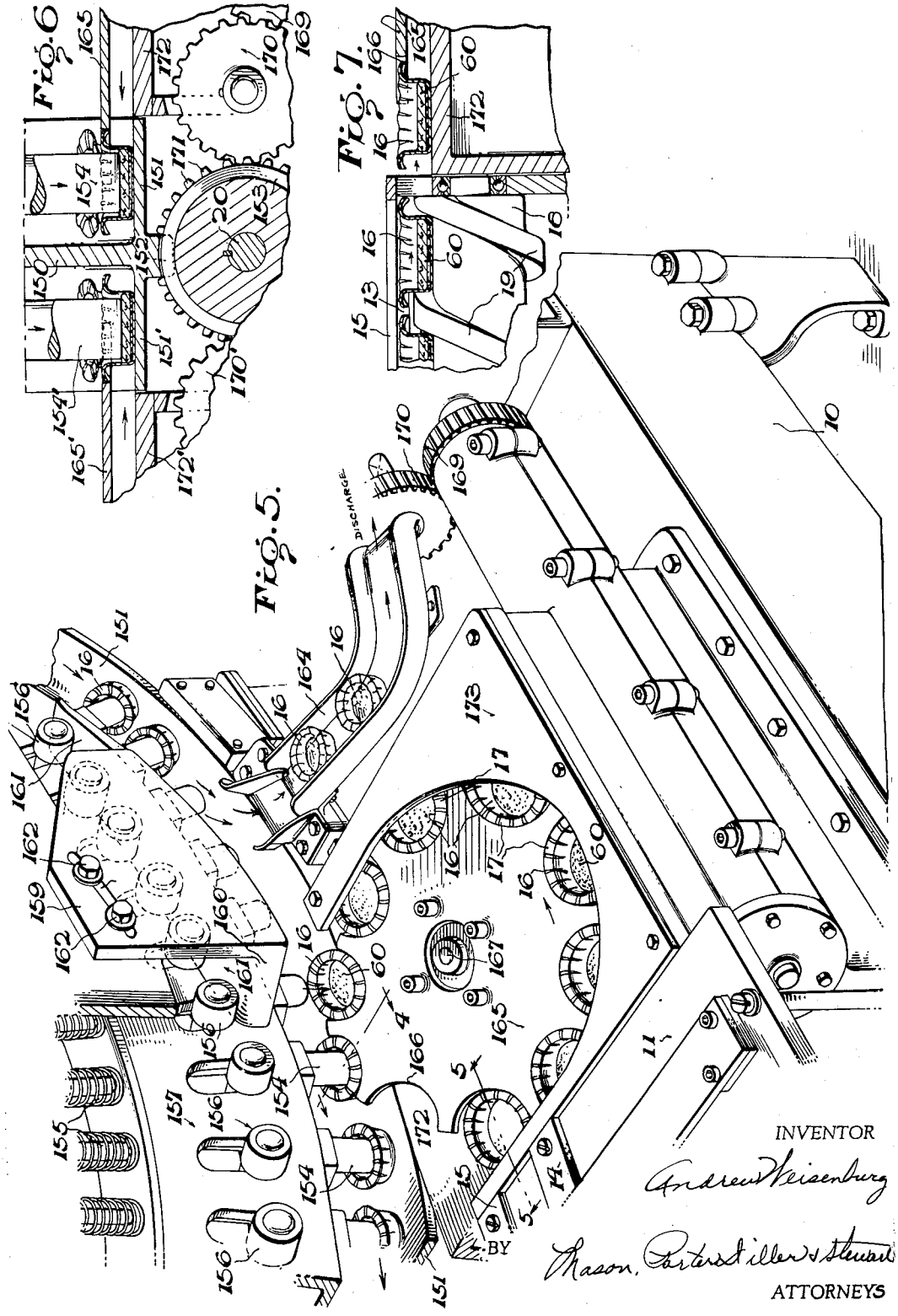
Fig. 2.

Inventor
Andrew Weisenburg
Mason, Porter, Miller & Stewart
Attorneys

June 19, 1956 A. WEISENBURG 2,750,987

PRESSER WHEEL FOR SECURING PADS TO CROWN CAPS

Filed Aug. 31, 1953 3 Sheets-Sheet 3



United States Patent Office 2,750,987 Patented June 19, 1956

2,750,987

PRESSER WHEEL FOR SECURING PADS TO CROWN CAPS

Andrew Weisenburg, Langhorne, Pa.

Application August 31, 1953, Serial No. 377,341

2 Claims. (Cl. 154—1.5)

In my copending application, Ser. No. 241,048, filed August 9, 1951, now Patent No. 2,695,650, there is shown a combination of units cooperating to feed crown caps in a straight line and at a continuous relatively high speed and while the caps are moving to insert pads in the caps and secure them therein. One of these units is a presser wheel in which the pads are pressed against an adhesive in the cap and subjected to heat for uniting the pads to the caps.

The present application is directed to this presser wheel and its associated mechanism for fixing the pads to the caps.

An object of the invention is to provide a presser wheel mounted for rotation about a horizontal axis and having a plurality of units operating in succession to receive the caps and to press the pads against the adhesive in the caps with means operating in timing with the rotation of the presser wheel for positively placing the caps in the cap receiving and pressing units.

A further object of the invention is to provide a presser wheel of the above type wherein the caps are pressed against the inner surface of a flange at the periphery of the wheel and means is disposed about the wheel for heating said flange and cap.

Another object of the invention is to provide a presser wheel of the above type wherein each unit includes a spring operated plunger for pressing the caps against the flange of the wheel and wherein means is provided for raising the plungers from the flange to permit the placing of a cap with a pad therein beneath the plunger and for releasing the plungers in succession and in timing with the placing of the caps.

Another object of the invention is to provide a presser wheel of the above type with a continuously rotating disc movable over the flange and having pockets for the caps for positively placing the caps in succession on the flange beneath the raised plungers.

A still further object of the invention is to provide a presser wheel having a central web mounted for rotation about a horizontal axis with peripheral flanges projecting laterally from each side thereof and a series of spring operated plungers associated with each flange, with independent means for placing caps with the pads therein on the flange beneath the plungers.

These and other objects will in part be obvious and will in part be hereinafter more fully disclosed.

In the drawings which show by way of illustration one embodiment of the invention:

Figure 1 is a side view of a portion of a pad inserting machine and a presser wheel for securing the pads to the caps.

Figure 2 is a view in plan showing a portion of the presser wheel and the cap guides for delivering the caps to the presser wheel.

Figure 3 is a perspective view partly in section showing the guideways for the caps and the feed shaft with the spiral thread thereon for feeding the caps along the guideway.

Figure 4 is a view in perspective showing a portion of the presser wheel, the feed shaft for feeding the caps along the guideways and the operating means for rotating the presser wheel and also for rotating the devices which place the caps on the flange of the presser wheel.

Figure 5 is a view in perspective showing a portion of the presser wheel with the spring actuated plungers, the cam for raising the plungers and the disc which places the caps beneath the plungers.

Figure 6 is a view in section showing a portion of the presser wheel, the means for rotating the same and the feeding discs for feeding caps onto the flanges at each side of the wheel.

Figure 7 is a view in longitudinal section showing a portion of the feed screw delivering the caps with the pads therein to a pocket in the disc which places the caps on the flange of the presser wheel.

The improved presser wheel for securing the pads in the caps is shown in the illustrated embodiment of the invention as applied to a pad inserting machine wherein the caps are continuously fed along guideways leading to the presser wheel and disposed along the guideways is a means for applying adhesive to the cap, then means for inserting the pads in the caps after which they are fed into the presser wheel where the pad is pressed against the adhesive and the adhesive heated for setting the same. Briefly, the machine as a whole includes plates **11** and **12** which are spaced from each other. These plates extend from the receiving end of the machine to the presser wheel. The opposed upper edge portions of the plates are chamfered as indicated at **13**. The flange **17** of the cap **16** rests on these chamfered surfaces and thus the cap is supported and guided through the machine. Cover plates **14** and **15** are provided to complete the guideways for the flanges of the caps. The caps are fed along the guideways by a feed shaft **18** having a spiral rib **19** thereon. The helix angle of the spiral rib is uniform and therefore the spiral rib which engages the depending portion of the inverted cap will move the cap along the guideways at a continuous rate of speed.

In Figure 3 of the drawings one of the guideways and shafts for feeding the caps is shown. There is a second guideway and feed shaft illustrated in Figure 2. The outer supporting plate therefor is indicated at **11'**. The two feed shafts are shown in Figure 4.

The caps are fed from a chute **26** in which they are retained by a yielding finger **27**. A rotating shaft **31** is provided with plungers **34** which move one after another into the caps in the chute and the caps are forcibly withdrawn from the chute and placed in the guideway between the spiral ribs **19**. The spiral rib of the feed shaft will then feed the cap through the machine to the presser wheel. There are two chutes and two feed lines as noted above. The cap is first passed through the adhesive applying device which includes plunger pads **47** which takes the adhesive from a side roll and places it within the cap on the inner face of the top portion of the cap. The cap then passes through the pad inserting device. There are two pad inserting devices which operate to insert pads in alternate caps. Each pad inserting device indicated at **57, 57** is supplied with pads from the chutes **59, 59** respectively.

The pad feeding mechanism illustrated is shown and described in detail in my copending application of which the present application is a division and further description thereof is not thought necessary. After the pad has been inserted in the cap it then passes through a detector **138**. There is a similar detector **138'** on the other line of cap feed as shown in Figure 2. These detectors are carried by a housing **136**. Each detector includes plungers carrying a permanent magnet which will enter a cap and if there is no pad in the cap it will be diverted

into a discharge chute 146 on one line and a discharge chute 146' on the other line. After passing a detector the caps with the pads therein are fed into a pocketed disc which in turn feeds the caps into the presser wheel.

It is this presser wheel, together with the means for placing the caps with the pads therein in the wheel that constitutes the invention of the present application and a detailed description thereof will now be given.

There is only one presser wheel for the two feed lines. This presser wheel is carried by a shaft 148 and the shaft in turn is mounted in bearings carried by spaced brackets 149 mounted on the frame of the machine.

The presser wheel has a central web 150 (see Figure 6), from each side of which extend flanges 151 and 151'. The central web carries a gear 152 which meshes with a worm gear 153 on the main shaft 20. Mounted on the web of the presser wheel are a series of radially disposed plungers 154. There are plungers on each side of the wheel and they are located inside of the flanges 151 and 151' respectively. Associated with each plunger is a spring 155 which normally moves the plunger radially outwardly so that when it enters a crown cap it will press the cap against the flange as shown in Figure 6. Each plunger carries a stub shaft on which is mounted a roller 156. The stub shaft extends through slots in a plate 157 and the rollers are located just outside of the plates.

There is a web 158 on which is mounted a plate 159 carrying an inwardly projecting member 160 having a cam face 161. This plate 159 carrying the cam is secured to the web 158 by bolts 162, 162 passing through a slot 163 in the cam supporting plate. This permits the cam supporting plate to be adjusted.

This cam is so shaped and positioned that as the plungers approach the cam the roller 156 runs up onto the upper face of the cam. (See Figure 5.) If the plunger is pressing a cap against the flange 151 it will be lifted from the cap as the roller moves along the cam and this will release the cap so that it will be discharged into a chute 164. The plunger remains in its retracted position to which it has been moved by the cam and a pocketed disc 165 places caps on the flange so that when the plunger runs off from the cam it will move into a cap contacting the pad and press the pad tightly against the adhesive on the inner surface of the top of the cap and press the cap in turn against the flange 151. There is, of course, a similar cam operating on the plungers on the other side of the presser wheel and a similar pocketed disc for feeding caps onto the flange and a chute for receiving caps from the flange.

The disc 165 is provided with a series of pockets 166. The disc is rotated by a center shaft 167 on which the disc is mounted. The shaft 167 carries a worm gear meshing with a spiral gear on a shaft 168 and the shaft 168 carries a gear 169 which meshes with an idle gear 170 and the idle gear 170 in turn meshes with a gear 171 on the shaft 20. The feed shaft 18 feeds the crown caps with the pads therein into the pocket 166 of the disc 165.

Directly beneath the disc 165 is a supporting plate 172. This supporting plate extends all the way around the disc and is in alignment with the flange 151 at the position where the caps are moved onto the flange. (See Figure 6.) There is a cover plate 173 which overlies the crown caps in the pockets and retains them therein until they are delivered onto the flange 151 of the presser wheel. It is noted that the spiral rib 19 on the feed shaft 18 moves the cap positively into the pocket in the disc and the disc positively places the caps on the flange 151. The operation is the same on both feed discs but, of course, the discs are fed with caps independently from the two feed lines.

Associated with each flange on the presser wheel is a pipe 174. Mounted on the brackets supporting the presser wheel is a standard 174a. There is one on each side of the wheel and these standards support these pipes. These pipes have openings on their inner face which form a gas jet burner. The flame of the gas jet is directed against the outer face of the flange 151 and likewise the gas jets on the other side of the presser wheel are directed against the flange 151'. These gas jets extend only partially around the presser wheel but for a sufficient distance so that the heated flange will transfer heat to the top portion of the crown cap and through the top portion to the adhesive on the inner face thereof. The gas jets terminate some little distance from the discharge point so that the adhesive if thermoplastic will cool sufficiently so as to set before the cap and the pad therein is discharged from the machine.

The operation of the presser wheel will be briefly described. The caps with the pads therein are fed from the guideways by the spiral rib on the feed shaft directly into a continuously rotating pocketed disc. This disc in turn places the caps on the flange of the presser wheel while the plungers are raised by the cam 161. When the cap is centered beneath the plunger by the pocket in the feed disc the roller 156 holding the plunger raised will run off from the cam and the spring will at once force the plunger into the cap against the pad. Thus the pad is pressed against the adhesive and as the presser wheel continues its rotation the flame from the burners contacting the outer face of the flange will impart heat to the flange and from the flange to the cap and from the cap to the adhesive. If the adhesive is thermo-setting then the pad may be firmly secured to the cap by the heating of the flange. If the adhesive is thermoplastic then the heating period in the rotation of the presser wheel will be limited so that the adhesive may cool and set before the cap is discharged from the machine. As has already been noted the presser wheel has a central web with flanges projecting from each side thereof and there are plungers associated with each flange so that the two independent lines of caps in which pads are inserted are operated upon independently and simultaneously by the presser wheel.

It is obvious that minor changes in the details of construction may be made without departing from the spirit of the invention as set forth in the appended claims.

I claim:

1. A machine for securing pads to crown caps comprising guideways for supporting and guiding caps having an adhesive with the pad therein, means for feeding the caps along said guideways, a presser wheel disposed at the ends of the guideways and rotatable about a horizontal axis, said presser wheel having a laterally projecting flange at the peripheral edge, the inner face of the flange being smooth and unbroken and adapted to receive the caps, a series of plungers mounted on said wheel inwardly from said flange for radial movement, a spring for each plunger adapted to move the plunger outwardly toward the flange, a roller on each plunger, a cam disposed in the path of the rollers for raising the plungers away from the flange, a cap supporting plate at the end of said guideways onto which the caps are discharged, the cap receiving portion of the flange being in alignment with the upper face of the plate, a rotatable disc having radially projecting arms forming pockets adapted to receive the caps discharged onto said plate, the arms of the pocket in the disc being adapted to move over the plate and over the inner surface of the flange beneath a raised plunger and into alignment therewith so that when said plunger is released from said cam it will enter the cap while in the pocket and press the pad against the adhesive in the cap, and means for heating the flange and cap for setting the adhesive.

2. A machine for securing pads to crown caps comprising guideways for supporting and guiding caps having an adhesive with the pad therein, means for feeding the caps along said guideways, a presser wheel disposed at the ends of the guideways and rotatable about a horizontal axis, said presser wheel having a laterally projecting flange at the peripheral edge, the inner face of the flange being

smooth and unbroken and adapted to receive the caps, a series of plungers mounted on said wheel inwardly from said flange for radial movement, a spring for each plunger adapted to move the plunger outwardly toward the flange, a roller on each plunger, a cam disposed in the path of the rollers for raising the plungers away from the flange, a cap supporting plate at the end of said guideways onto which the caps are discharged, the cap receiving portion of the flange being in alignment with the upper face of the plate, a rotatable disc having radially projecting arms forming pockets adapted to receive the caps discharged onto said plate, the arms of the pocket in the disc being adapted to move over the plate and over the inner surface of the flange beneath a raised plunger and into alignment therewith so that when said plunger is released from said cam it will enter a cap while in the pocket and press the pad against the adhesive in the cap, and means for heating

the flanged cap and adhesive for a time sufficient to set the adhesive and secure the pads to the caps, said plungers when raised by the cam release the caps engaged thereby, and a chute at one side of the flange of the presser wheel receives the released caps.

References Cited in the file of this patent

UNITED STATES PATENTS

1,768,605	Johnson	July 1, 1930
2,113,592	Johnson	Apr. 12, 1938
2,138,923	Johnson	Dec. 6, 1938
2,218,540	Kronquest	Oct. 22, 1940

FOREIGN PATENTS

25,574	Great Britain	1912
468,641	Canada	Oct. 10, 1950