

Improvements in machines for making pill boxes and the like / [Franz Fettback].

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COMPLETE SPECIFICATION.

"Improvements in Machines for Making Pill Boxes and the like"

I, FRANZ FETTBACH, of Andrerterische Wiese 20, Hanover, in the Empire of Germany, Manufacturer, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:

- 5 The present invention relates to improvements in the machines described in the Specification of British Patent No. 19169 dated 25th September 1901.
- The present invention relates more particularly to improved arrangements for the supply or feed of the strips and for holding the strips on the spindle by means of an improved holder and for a device for holding the end of the
- 10 cut strip, also to improved means for lifting and placing in position the bottom of the box and folding over the edge of the covering strip.
- The various new parts are shown in the annexed drawings and those already referred to in Patent No. 19169 of 1901 are indicated by the same reference letters and numerals as in the said patent.
- 15 Fig. 1 is a vertical section of the new strip feed device,
Fig. 2 is a plan view thereof,
Fig. 3 is a cross section and plan view of an essential part of the device on a larger scale.
- Figs. 4 and 5 are vertical sections of the strip holder in the working and
- 20 resting positions respectively. Fig. 6 is a cross section on the line A—B of Fig. 5 seen in the direction of the arrow.
- Fig. 7 is a side view partly in section of the arrangement for holding down the cut end of the strip.
- Figs. 8 and 9 are detail views of two different parts shown in Fig. 7.
- 25 Fig. 10 shows the arrangement for lifting and placing in position the bottom and lid of the box, Fig. 11 is a section on the line C—D of Fig. 10.
- Figs. 12 and 13 illustrate two different working positions of a device for folding over the edge of the covering strip, and Figs. 14 and 15 represent another form of folding device also in two different working positions.
- 30 The new strip feed device shown in Figs. 1 to 3 is an improvement over that of Patent 19169/01 by reason of one of the cheeks or grippers 7 8, being formed by a flat spring 8.
- The strip is guided between the two parts 7 and 8 as before, the spring 8 bearing on the non-adhesive side of the strip. The pressure of the spring 8
- 35 is adjustable by means of the screw *c*, by which the spring is fastened to the end of the gripper 7.
- The adhesive side of the strip abuts against a special slide surface *f* (see Fig. 3). The friction to which the strip is subjected during its passage between slide surface *f* and the end of the spring 8 keeps the strip tensioned on its
- 40 way to the spindle.
- The above described features of the feed device have the following important advantages.
- The tension of the spring 8 is exactly regulatable and the spring can be easily removed and interchanged or rendered inoperative by turning it aside.

[Price 8d.]

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(Fig. 2) When in use the end of the spring 8 is kept in position by the flanges or the like *g* which also serve as guides to prevent lateral displacement of the strip. The perforated sliding surface *f* is preferably formed by an easily interchangeable plate, and prevents the adherence of the strip by considerably reducing the surface which comes into contact with the strip and it also affords the possibility of introducing into the holes of the plate *f* a substance which counteracts the adhesive action and tendency to accumulate the glue or other adhesive. The uniform distribution of the holes ensures uniform pressure on the strip. The whole device can of course be moved at intervals by suitable means as indicated in the patent before referred to so as to obtain a forward movement of the strip towards the mandril before each winding operation.

The new form of finger shown in Figs. 4 to 6 and adapted to grip the end of the strip placed on the mandril and to hold the said end fast until the winding is finished is arranged on an adjustable slide ring and is so constructed that when the device is moved towards the strip the finger is pressed down on to the end of the latter by a projecting arm, whereas when the device is moved away from the strip the finger ascends and releases the wound coil.

Fig. 4 shows the essential parts of this holding device in the working position of the latter; Fig. 5 shows the same parts in the resting position. The finger 14 tapers towards the front end and is adapted to move freely within certain limits on the adjustable slide ring 21, in the longitudinal direction of the mandril. A portion of the upper surface of the finger forms an inclined plane *d*, against which the projecting arm *c* of the ring is adapted to abut. A stud *h* is formed on the underside of the finger 14 and abuts against the surface 29 of the sleeve 20 at the end of the forward movement of the finger.

The rear end of the finger is formed as a spring adapted to automatically raise its front end when the device is moved away from the strip.

The action of the device is as follows:

During forward movement of the slide ring 21 in the direction of the arrow (Fig. 5) the finger is pushed forward towards the end of the mandril with its foremost end in a raised position until the stud *h* on the underside of the finger abuts against the surface 29 of the sleeve 20 whereupon the forward movement of the finger ceases. The arm *c* on the slide ring 21 which continues to move forward thereupon abuts against the inclined surface *d* of the finger and depresses the latter, overcoming the resistance of the spring at the rear. The end of the strip 1 is thus gripped. A spring *i* may be provided at the rear end of the ring in such a manner as to bear against the end of the finger when the latter projects (see Figs. 4 and 6).

The finger remains in the gripping position until the slide ring 21 and the arm *c* are pushed back and allow the front end of the finger to be lifted by the spring at the rear; the finger is thereupon moved back by means of the pin *k* which takes into a recess *l* in the upper surface of the finger.

The purpose of the device shown in Fig. 7 to 9 is to prevent the end of the strip from moving away from the coil 2 after the strip has been cut, as it frequently has a tendency to do. The device for pressing down the end of the strip consists of a movable arm *m*¹ or *m* (Figs. 8 and 9) having at its end either teeth or a curved plate adapted to fit the circumference of the coil. This device is preferably connected with the cutting device *n* in such a manner that the movement of the knife operates the arm *m* or *m*¹. The cutting operation and the holding down of the end of the coil are thus rendered approximately simultaneous.

The use of teeth at the end of the movable arm, ensures a secure holding on the strip by reason of the indentations made in the latter, whereas when a curved holding plate is used the increased contact surface produces the necessary adherence.

As already indicated the device for pressing down the end of the coil can be operated independently from the cutting device or in connection with the knife

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and any suitable means can be used for operating the former, for instance a bell crank lever 12 actuated by a cam disc 13 as shown in Fig. 7.

The device shown in Figs. 10 and 11 serves to supply and place in position the disc shaped bottom or lid, after the side wall 2 of the box has been finished, as shown in Fig. 7. A number of the disc shaped bottoms 3 are placed in a trough or the like and are automatically pushed forwards, for example by a weight or spring. A slide *o* moves at intervals backwards and forwards or upwards and downwards at the end of said trough or the like and conveys the discs separately to the mandril into the position in which they are to be fastened to the walls of the box.

The said slide may be operated by a bell crank lever *p* and a cam disc or by other suitable means, *r* represents the aperture into which the discs 3 are moved from the trough. From this aperture the discs are separately conveyed to the position 6 in front of the mandril.

The new and important feature of the slide *o*, is the downward extension of the latter, shown in the drawing. The extension covers or fills the aperture *r* when the slide is in the position shown in Fig. 10 in dotted lines, that is to say, when the slide is at the end of its upward stroke, conveying a disk to the mandril, so that the next disc cannot enter the slot *q* until the slide has returned to its lowest position. When the slide has so returned, the next disc 3 is automatically moved into the slot *q*, the discs being stamped out to the proper size and placed in a row which is pushed or forced forward in any known manner for instance by a weight or a spring. The slide can then convey a fresh disc to the mandril during its next upward motion.

For the exact working of this feed device, it is necessary that the slot in which the slide moves should be of the exact width required. For this purpose one side of the said slot is formed by a plate which is fixed by means of screws *s* and adjustable by means of adjustment screws *s*¹.

The new folding device shown in Figs. 12 and 13 serves to fold over the projecting edge of the box strip 4 by means of the mandril 6 itself.

The box, with bottom or lid disc 3 and side walls 2 is placed on the mandril 6 which latter is in the improved device hollow, and the interior of which contains the holding device *t*: opposite the mandril, the rod *t*¹ abuts against the bottom disc 3. The outer or covering strip to be folded is marked 4. This strip provided with adhesive on its inner surface projects to a certain extent beyond the edge of the wall of the box as shown in Fig. 12 and is folded over against the inside of the box by means of the new arrangement in the following manner.

The mandril 6 is pushed back in the direction of the arrow by suitable means (Fig. 12). As the disc 3 is firmly connected with box wall 2 as described in Specification 19169 of 1901 and the bottom is held between the two holding devices *t* and *t*¹, the box 2, 3 remains stationary during the withdrawal of the mandril (Fig. 13). When the mandril 6 has been moved back a sufficient distance the bending inwards of the edge of the strip is effected by means of a press roller *u* or the like in an already known manner. Then by moving the mandril back into the position indicated in Fig. 12 the edge of the covering strip is folded inwards and placed tightly against the inside of the box wall.

During this folding operation, the side of the disc 3 situated opposite the annular end surface of the mandril 6 can be supported by means of the movable support *v* which is pushed forward for that purpose if the rod *t*¹ does not provide sufficient support. In this case that part of the covering strip which is folded over the edge of the bottom is pressed tight by the support *v* at the same time.

The arrangement described can be modified in such a manner that the mandril remains stationary in the position indicated in Fig. 12. and the parts *t* and *t*¹ with the box are moved away from the mandril.

Figs. 14 and 15 represent another form of folding device which is more

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particularly intended for making the so-called necks of the boxes, which, as is known must be provided with an inwardly folded covering strip. The arrangement can however in general also be used for folding over the covering strip which is stuck round the sides of the box.

The essentially new feature of this device consists in the arrangement of a circumferential groove or recess in the mandril 6¹ directly beside the surface on which the strip is wound. The projecting edge of the covering strip is situated above this recess and can first be folded over rectangularly by means of a suitably shaped roller or the like and then folded inwards onto the surface of the mandril by means of one edge of the groove and longitudinal displacement of the mandril or the box.

The essential parts of this arrangement are represented in the drawing in two working positions.

6¹ is the mandril, the principal feature of which is a groove or recess *w* which encircles it. This groove is of such size that the projecting edge 5 of the strip covering the neck 2¹ of the box can be conveniently folded into it. As can be seen from the drawing, the groove *w* is next to the winding surface of the mandril, so that after the covering strip has been pasted on, the edge 5 of the said strip is situated above the groove.

This edge 5 is then bent over rectangularly in an already known manner by means of a flanged roller *x* or the like (see dotted lines, Fig. 14).

If thereupon the mandril is displaced in the direction of the arrow, shown in Fig. 14, while the neck 2¹ abutting against the sleeve *y* remains stationary, the rectangularly bent edge of the covering strip is folded over against the inside of the neck 2¹ by the edge of the recess *w* (see Fig. 15) and pressed tight at the same time.

Of course the same result can be obtained by a corresponding displacement of the neck 2¹ in the opposite direction by displacing the sleeve *y* while the mandril remains stationary.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed I declare that what I claim is:

1. In machines for the manufacture of pill-boxes and the like as described in Patent No. 19169 of 1901 a strip feed arrangement comprising a perforated sliding surface *f* and a spring 8 which is regulatable by means of a screw *c* and serves as holding or pressing device, substantially as described.

2. In machines for the manufacture of pill boxes and the like as described in Patent No. 19169 of 1901 a finger 14 with a resilient or spring pressed end and movable in an adjustable slide ring (21), a stud *h* on the under side of the said finger, an inclined sliding surface *d* on the upper side of the said finger and a pressure arm or lever *e* fixed to the slide ring and adapted to abut against the said sliding surface, substantially as described, for the purpose set forth.

3. In machines for the manufacture of pill boxes and the like as described in Patent No. 19169 of 1901 a pressing or holding device comprising an arm or the like *m m*¹ provided with teeth or a curved surface, substantially as described.

4. In machines for the manufacture of pill boxes and the like as described in Patent No. 19169 of 1901 a device for placing in position the bottom or lid discs of the box, comprising a supply or feed slide 0 which is sufficiently large to cover during its stroke the aperture *r* through which the discs enter the slot *q* in which the slide moves, the width of the said slot being adjustable by means of adjusting screws substantially as described.

5. In machines for the manufacture of pill boxes and the like as described in Patent No. 19169 of 1901, a folding device for the outer or covering strip comprising a movable hollow winding mandril 6, a holding device *t* inside the

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said mandril and a holding device t^1 at the end of the latter, substantially as described.

6. In machines for the manufacture of pill boxes and the like as described in Patent No. 19169 of 1901 a device for folding over the projecting edge of the
5 covering or outer strip more particularly for use in the necks of boxes, comprising a groove or recess w encircling the mandril G^1 for folding over the edge of the covering strip by displacement of the mandril or the box, after the said edge has been folded into the said groove, substantially as described.

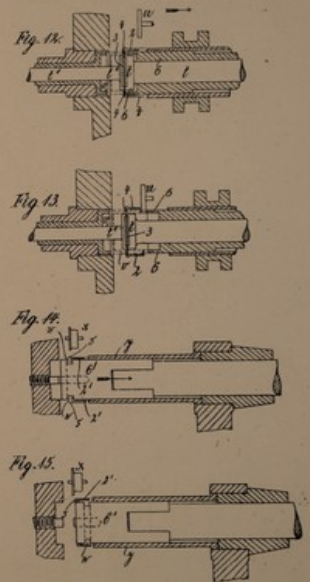
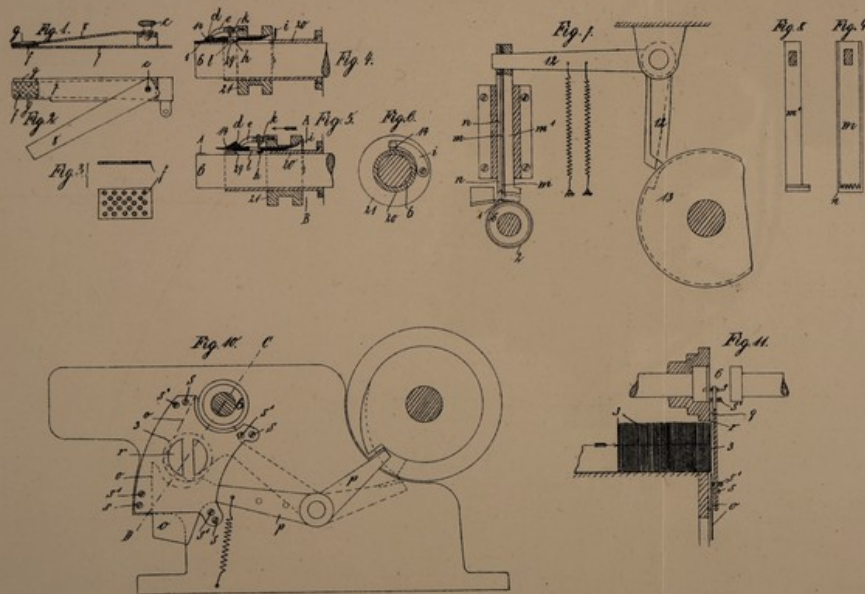
Dated this 13th day of September 1902.

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[This Drawing is a reproduction of the Original on a reduced scale]

