April 18, 1939. A. J. JONSSON 2,154,508

DEVICE FOR PRODUCING SEALING DISK SETS FOR CLOSURE CAP SHELLS

Filed Jan. 23, 1936 3 Sheets-Sheet 1

Fig. 1

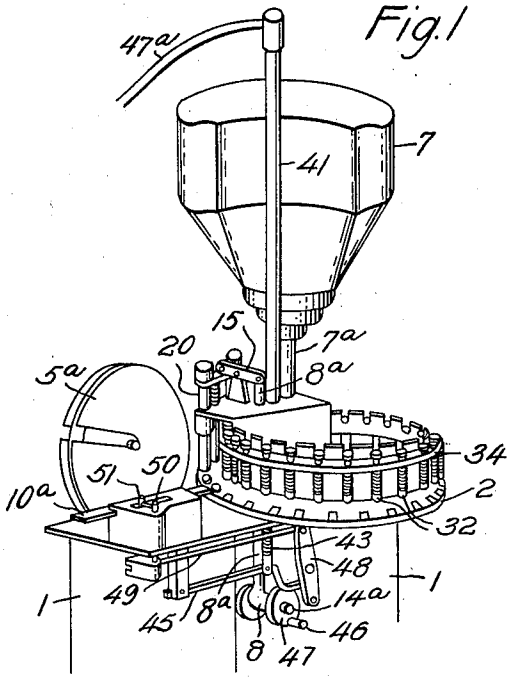
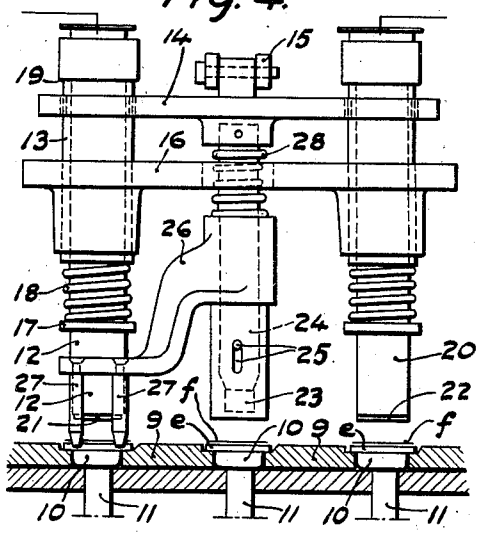


Fig. 4.



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Fig. 2.

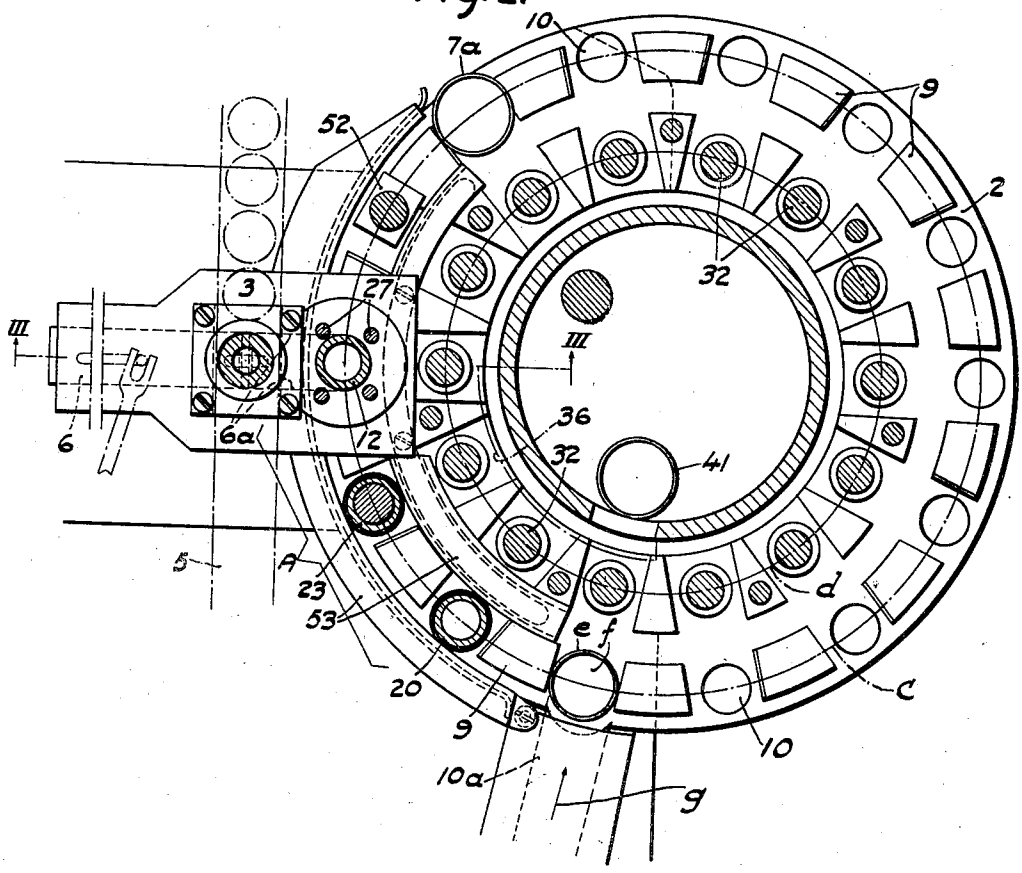
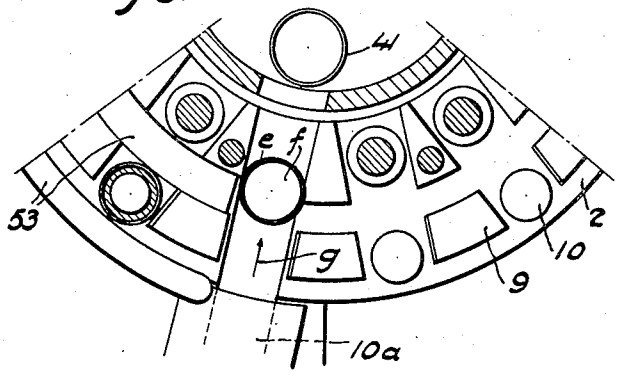


Fig. 5.



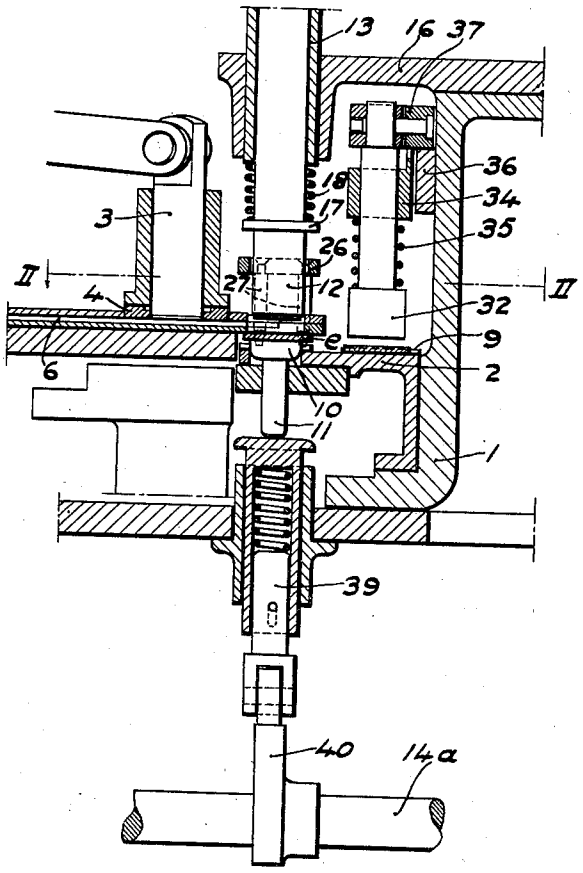
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Fig. 3.



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UNITED STATES PATENT OFFICE

2,154,508

DEVICE FOR PRODUCING SEALING DISK SETS FOR CLOSURE CAP SHELLS

Anders Josef Jonsson, Linkoping, Sweden

Application January 23, 1936, Serial No. 60,482
In Sweden January 26, 1935

10 Claims. (Cl. 154—1)

My present invention relates to improvements of the object of my co-pending U. S. Patent application, Serial No. 716,050, filed on March 17, 1934.

My said application substantially refers to a machine for producing disk sets to be inserted into closure cap shells. Said sets generally consist of a packing disk usually of cork material—hereinafter called sealing disk—and a facing disk or spot. Said spot is punched out of a blank strip laterally in respect of the center axis of the cap and of the sealing disk and at a longer or shorter distance from both, is centered with respect to the sealing disk and is then fixed to the sealing disk by means of a heated adhesive under pressure and cooling, for example, in connection with the insertion of the disk set into the cap shell.

The improvements of the above mentioned machine that form the object of my present invention chiefly have for their objects to guarantee the centering and fixing of the spot to the sealing disk, special steps having been taken to provide for strong cooling of the disk set after the centering of the spot and the heating of the adhesive, and at the same time to provide for a strong pressure action from a great number of cooling and pressure plungers. In order that the latter shall not make the machine too voluminous they are, together with heating plungers, according to the invention arranged in a circle above a table, which, rotating around an axis in the center of the circle, moves the disk sets around from one plunger to the other in one or more circular paths. At the end of the said movement the disk sets, in their proper turns, are moved into a discharge channel for the purpose of being moved on to tools for immediate and direct insertion into cap shells, or to a cartridge, for example, a tube in which they are stacked for later insertion.

An embodiment of the object of my invention is shown in the accompanying drawings.

Figure 1 shows a diagrammatical perspective view of part of the machine to which the present invention relates.

Figure 2 is a section II—II, from above, in Figure 3.

Figure 3 shows a section III—III in Figure 2, and

Figure 4 a view from the left in Figure 2 of a part of the machine indicated by the bracket A in Figure 2.

Figure 5 shows part of the section shown in Figure 2.

In Figure 1 only the principal parts are shown and provided with reference numerals.

Numeral 1 indicates the frame of the machine, 2 a rotating table, 3 the punching device, which against the punch die 4 punches out the spot, 5 indicates the blank strip running from a roll 5a, and 6 is the conveyer, which feeds the punched out spots in their proper turns, each right above its sealing disk. 6a indicates guides for the conveyer and for the spot. In this connection I do not mention how the punching device and the sliding member receive their motions, as known machine elements may be used and also have been shown in my co-pending application above mentioned.

The sealing disks are fed from a cartridge 7 through a tube 7a down on to the above mentioned table 2, which is annular and rotatably mounted in the frame 1 and which is rotated stepwise by means of some suitable mechanism, for example, a common Maltese gear, the construction of which will not be described in this connection as it does not fall within the scope of this invention and as it is well known before. Shoulders or the like, indicated by 9, on the table serve as drivers for the disks. Between the said shoulders there are provided centering pedestals 10 spaced in the same distances as the shoulders. By means of a spindle 11 each pedestal 10 is mounted in the table so that the spindle extends some way beneath the table (Figure 3). 12 indicates a heating plunger, which is movable up and down in a sleeve 13 (Figure 3) located in a cross piece 14, which in its turn is movable up and down and receives its said motion from a shaft 14a via a cam or crank 8, rod 8a and a lever 15 (Figure 1). A bracket 16 in the frame guides the sleeve to the necessary extent. In a known manner an electric resistance for heating the plunger is provided inside the plunger. Between the sleeve 13 and a stop ring 17 (for the purpose of being secured it is preferably bipartite) on the plunger there is a buffer spring 18 imparting a suitable springiness to the plunger when the latter is pressed against the underlying sealing disk. The downward motion of the plunger in the sleeve is terminated by the upper edge of the sleeve 13 and by shoulders 19. The cross piece 14 carries still another heating plunger 20 mounted in the same manner.

The plungers, however, differ from each other in that the first mentioned plunger 12 with its heating surface, at 21, is adapted to act on the center portion of the spot, the other plunger having an annular heating surface, at 22, for

the purpose of acting upon the spot along the edge portion thereof, yet not as far as to the very edge so as not to press the adhesive outside the edge. Between these two plungers there is a cooling plunger **23** mounted on a spindle **24** fixed in the cross piece **14**. It is movable up and down on the spindle and is guided by a groove and pin guide **25**. Further, the spindle **24** guides a holder **26** for some centering pins **27** conical at their free ends, the pins **27** being arranged around the plunger **12**. Under the action of a buffer spring **28** the plunger **23** as well as the holder tend to assume their lower position on the spindle **24** the said position being determined by the groove and pin guide **25**. The three plungers **12**, **20** and **23** are spaced in the same distances as the pedestals **10** and are placed in such a manner that in all positions of the table they are each located right above its pedestal **10**.

Beside the table **2** there is mounted a horizontally movable conveyer **10***a* (Figures 1, 2, 5) in such a position that a pedestal **10** comes right before the table every time the table has been turned one step. The conveyer is then moved in the direction of the arrow *g* (Figure 5) and pushes a sealing disk *e* with the spot *f* applied thereon over to an inner position on the table where it then remains until the table has performed one revolution when it is pushed from the table towards the center by the conveyer **10***a* and an intermediate sealing disk.

The conveyer receives its motion from a cam disk **47** (Figure 1), a lever **48**, an articulated rod **49**, a shaft **50** and a driver **51**. As a consequence the sealing disks during the treatment are moved by the table in two paths concentrically located with respect to the center of the table and, in Figure 2, indicated by *c*, *d*. Cooling plungers **32** move with the sealing disks in the path *d*, the said plungers being mounted in an annular holder **34** rotating with the table **2** (see Figures 1, 3), so that they are movable up and down, a spring **35** pressing each of them against an underlying sealing disk during the greater part of the revolution. During the remaining part of the revolution each plunger passes a stationary guide rail **36**, on which a roller **37**, which is journalled on the plunger spindle, rides thereby lifting the plunger. The said guide rail is shown in cross section in Figure 3 and in dot-and-dash lines in Figure 2. It is arranged in such a manner that the respective plunger is lifted when the sealing disks are to be exchanged by the sliding member **10***a*.

The described mechanism operates in the following manner:

During the rotation of the table a sealing disk *e* is pushed from the pile in the tube **7***a* by the shoulder **9**, which is located behind the same, up to and below the heating plunger **12**. At the same time the sliding member **6** pushes a punched out spot *f* to right above the sealing disk. By means of a spindle **39** and a cam disk **40**, which is driven from the shaft **14***a*, the underlying pedestal **10** is lifted to a position immediately below the spot. During the upward motion of the pedestal **10** the sealing disk *e* contacts with the centering pins and is centered by the same with respect to the spot *f*. The heating plunger **12** is now pressed down for a moment, and when it is lifted the table **2** is moved one step so that the sealing disk will be located below the cooling plunger **23**. At the same time another sealing disk has been placed below the heating plunger **12**, where the above mentioned operation is repeated. During the next move the first mentioned sealing disk will be located below the heating plunger **20**. A third sealing disk has now been placed below the heating plunger **12**. From Figure 4 it is seen immediately that the plungers **12**, **20** and **23** are lowered and lifted simultaneously. While passing the plungers **12**, **20** and **23** the sealing disks are guided by stationary segments **53**. At the next move of the table the first mentioned sealing disk comes right before the sliding member **10***a* and by the latter is pushed into the path *d*, i. e. to below a cooling and pressure plunger, which is lifted by the guide rail **36**. At the next move of the table the said cooling and pressure plunger is lowered and is pressed against the sealing disk *e*. It then rotates with the table until it comes back to the same position when it is pushed away from the table by the sliding member and a sealing disk lying before the sliding member.

In case the above described devices are mounted on a machine making cap shells the disk sets may be immediately inserted into the cap shells. In such a case the respective disk is caused to fall into a channel to be forwarded to the inserting tool. If the sealing disks are not to be inserted immediately but, for example, are to be packed to be inserted by means of other machines and at some other place, they may be fed into a tubular cartridge **41**. The feeding member may consist of a piston **43** (Figure 1), which lifts the disk from below into the tube in time with the sliding member feeding the disks. The said piston receives its lifting motion by means of a lever **45** and a cam or crank pin **46**. In order that the disks shall not fall back, when the piston moves downwards, the tube is provided with a locking mechanism. The said locking mechanism may be mounted in the machine proper, if desired. The tube is detachable, so that the whole pile of disks may be removed from the machine in order to be packed. For full automatic operation the upper end of the tube may be provided with an electric contact, which, when the tube is charged, actuates an electromagnet—the cord is indicated by **47**[a]—which connects the cut-out of the machine, so that the machine stops, after which exchange of tubes can be effected.

Alternatively, the tube **41** may be applied below the table of the machine and the sealing disks be fed directly down into the same by means of the sliding member **10***a*. This simpler arrangement, however, involves a certain risk of some disk or other being placed edgewise in the tube by which the stacking will be disturbed.

In order to stop the machine, possibly only the feeding of the blank strip **5**, possibly also for simultaneous signaling, in case the supplying of sealing disks should be unexpectedly interrupted, a so-called feeler **52** may be provided in the path of the disks, which in a suitable manner is connected with the driving mechanism of the machine or of the blank strip and with a signalling device, respectively, and which keeps the former in and the latter out of function by the action of the sealing disks.

Various modifications may be made in construction and arrangement of parts without departing from the scope of the invention. Especially it may be mentioned that the invention is not limited to sets of two disks only. Each disk

may for instance, be composed of two or more layers of material.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a machine for adhesively uniting sealing disks and spots in centered superposed relation, a rotatable table, means for withdrawing an individual sealing disk from a stack and feeding it onto said table, means for rotating the table stepwise to advance said disk successively to different work stations, at one of said stations means to vertically displace said disk, guide elements to engage the peripheral edge of the disk during the vertical displacement of the latter so as to guide the disk into a predetermined centered position, and means to feed a spot between said guide elements into centered superposition with respect to said vertically displaced disk, and at some of said stations means for applying heat and pressure to said disk set, said last-named means comprising a series of spaced plungers arranged above the table.

2. In combination with the elements set forth in claim 1, a set of cooling pressure plungers, and a conveyor at one of said stations for moving said disk set from the heat and pressure means to one of said cooling pressure plungers.

3. In a machine for adhesively uniting sealing disks and spots in centered superposed relation, a rotatable table, a series of spaced vertically displaceable pedestals arranged in a concentric circle on said table, means for rotating the table stepwise to advance the pedestals successively to different work stations, at one of said stations means for withdrawing an individual sealing disk from a stack and feeding it onto one of said pedestals, at a second station means to temporarily lift each pedestal arriving at said station, guide elements to engage the peripheral edge of the disk on said pedestal during the upward movement of the latter so as to guide the disk into a predetermined centered position, and means to horizontally fed a spot between said guide elements into centered superposition with respect to said lifted disk, at at least one of said stations means for applying heat to said disk set, and at a subsequent station a conveyor for moving said set out of the circular path of travel of said pedestals.

4. In a machine for adhesively uniting sealing disks and spots in centered superposed relation, a rotatable table, a series of spaced vertically displaceable pedestals arranged in a concentric circle on said table, a series of cooling pressure plungers arranged on said table along a circle concentric to said pedestal circle and having a diameter smaller than that of the pedestal circle, means for rotating the table stepwise to advance the pedestals successively to different work stations, at one of said stations means for withdrawing an individual sealing disk from a stack and feeding it onto one of said pedestals, at a second station means to temporarily lift each pedestal arriving at said station, guide elements to engage the peripheral edge of the disk on said pedestal during the upward movement of the latter, so as to guide the disk into a predetermined centered position, and means to horizontally feed a spot between said guide elements into centered superposition with respect to said lifted disk, at at least one of said stations means for applying heat to said disk set, and at a subsequent station a conveyor for moving said set from the circular path of travel of said pedestals to one of said pressure plungers.

5. The combination of elements set forth in claim 1, said plungers including one adapted to act on the central portion of the disk set, another adapted to act on the outer portion of the disk set, and an intermediate cooling plunger.

6. The combination with the elements set forth in claim 4, of yieldable means urging said plungers down, and means for automatically raising each plunger as it comes into alignment with said conveyor.

7. The combination with the elements set forth in claim 3, of receiving means adapted to accommodate a plurality of disk sets, said means being arranged in the path of movement of said conveyor.

8. The combination with the elements set forth in claim 3, of a receiving cartridge adapted to accommodate a plurality of disk sets, said cartridge comprising a tube removably mounted above the path of movement of said conveyor, and a piston arranged to push disk sets successively up into said tube.

9. The combination with the elements set forth in claim 3, of receiving means adapted to accommodate a plurality of disk sets, said means being arranged in the path of movement of said conveyor, and means for automatically stopping the operation of the machine after a predetermined number of disk sets have been accommodated in said receiving means.

10. The combination of elements set forth in claim 1, said guide elements comprising a vertically yieldable bracket carrying distributed along a circular line, a plurality of vertically projecting pins conical at their free ends.

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