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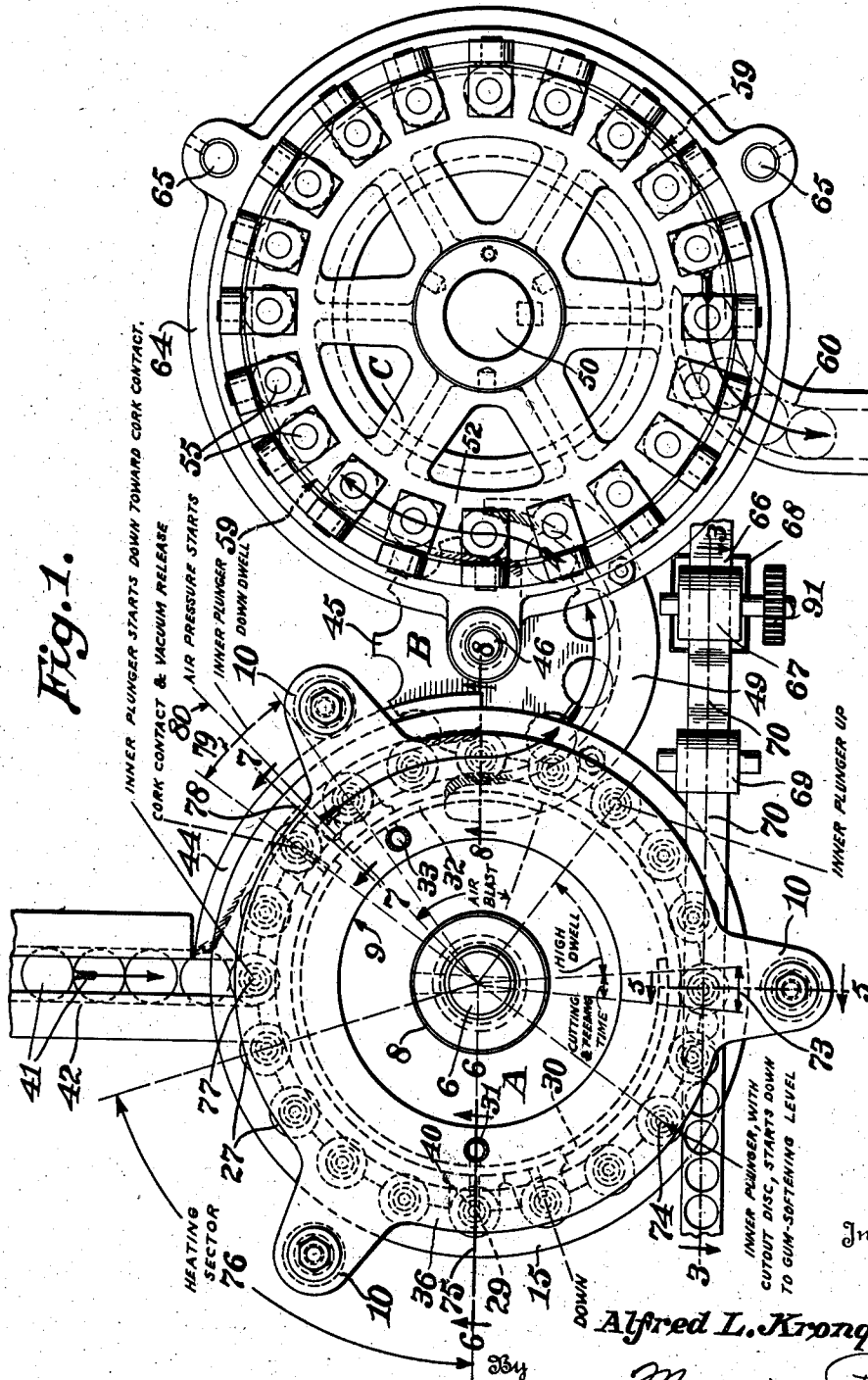
A. L. KRONQUEST

2,218,540

CROWN CAP SPOTTING APPARATUS

Filed Sept. 20, 1937

4 Sheets-Sheet 1



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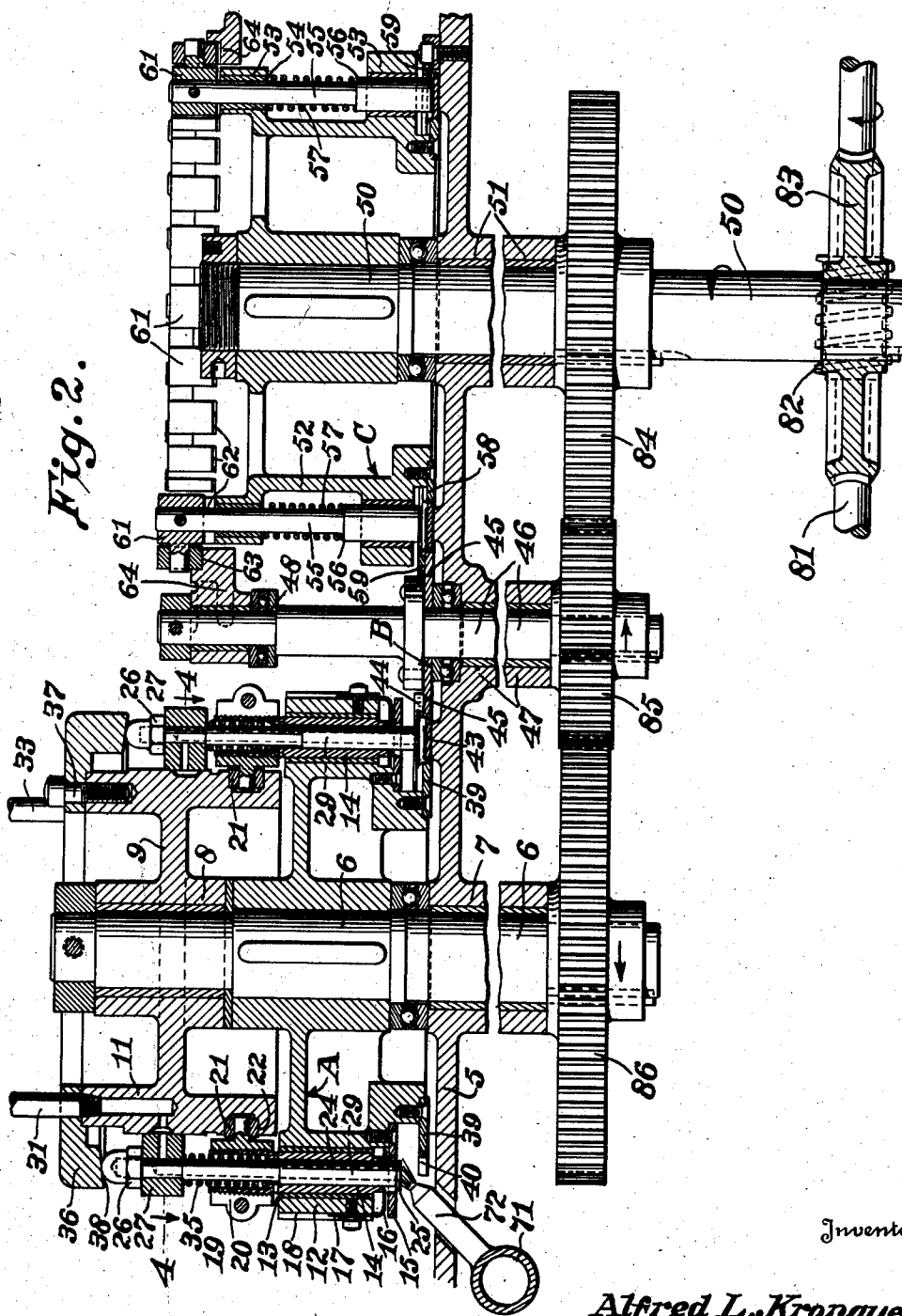
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CROWN CAP SPOTTING APPARATUS

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4 Sheets-Sheet 2



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CROWN CAP SPOTTING APPARATUS

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Fig. 3.

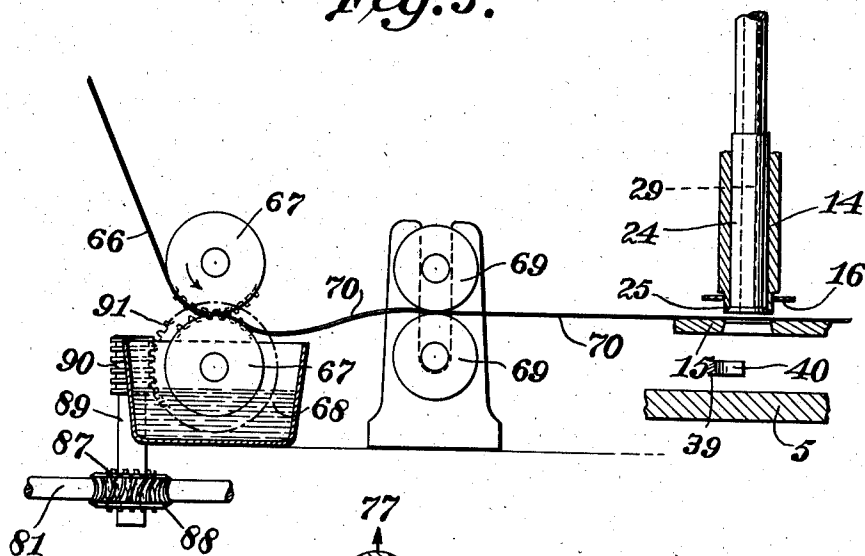
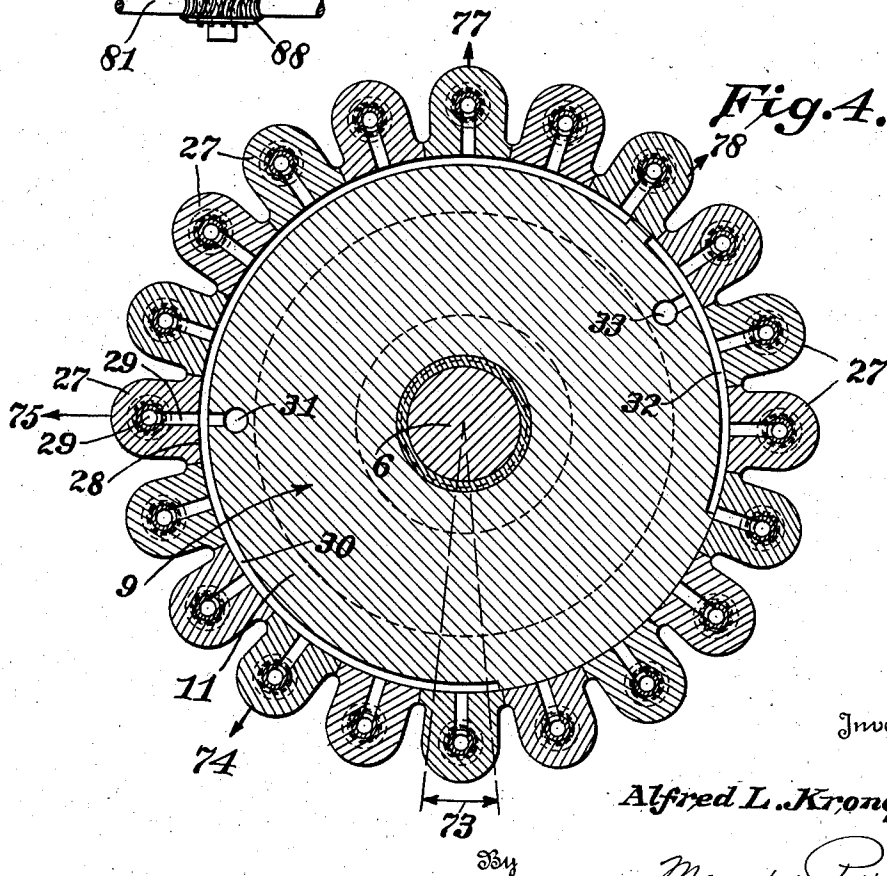


Fig. 4.



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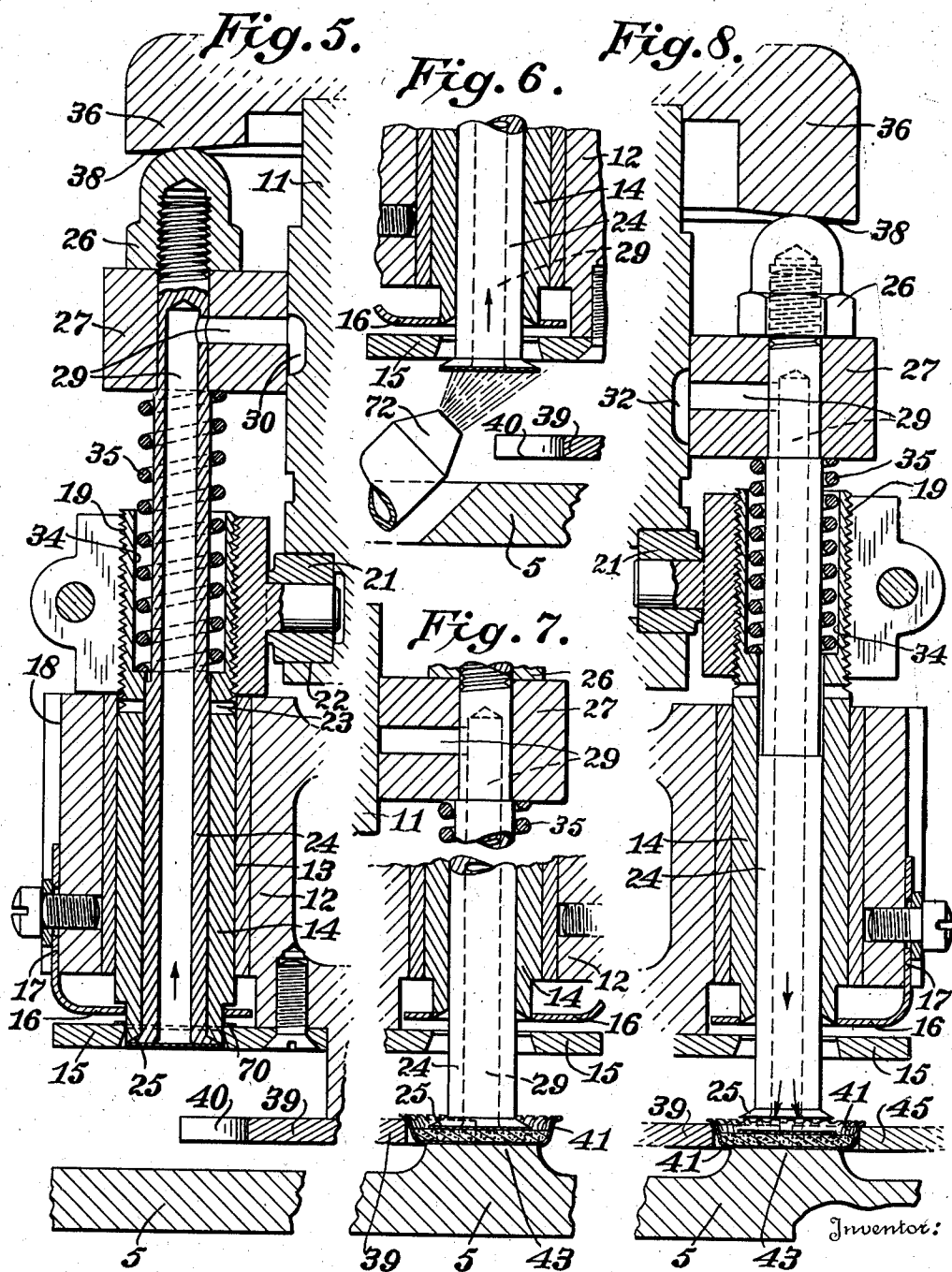
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CROWN CAP SPOTTING APPARATUS

Filed Sept. 20, 1937

4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,218,540

CROWN CAP SPOTTING APPARATUS

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Application September 20, 1937, Serial No. 164,823

18 Claims. (Cl. 113—30)

The invention relates generally to the art of assembling closure caps of the well known spotted crown type and primarily seeks to provide a novel apparatus for forming and affixing the center spots carried by the sealing pads contained in such caps.

Bottles and other forms of containers for beer or similar beverages usually are sealed by crown caps equipped with pads of cork or other suitable yieldable sealing material faced with liner disks of aluminum or other foil or treated paper so as to prevent direct contact between the beverage and the pad and also to prevent leakage of gases. Such disks preferably are of the "center spot" type which are smaller in diameter than the pads so as to protect the beverage from pad contact and yet permit sealing contact between the container pouring neck and an annulus of the more effective sealing material of the pad. Various methods and apparatus have been developed for forming and affixing center spots and some, which have proven very effective, have employed rolled strip supplies of spot material coated with heat fusible adhesive, heat being applied to render the adhesive soft or tacky and pressure later being applied to set the applied spots. In such methods and apparatus difficulties have been encountered in the handling of the adhesive bearing spot material, in the feeding of the material and in the formation and centering of the spots with respect to the caps to which they are to be affixed, and in the controlling and affixing of said spots. To the remedying of these deficiencies my present inventive efforts have been addressed.

Among the objects of the invention is to provide a novel apparatus for conditioning, feeding, forming, controlling and affixing spot material and spots formed therefrom which includes, the feeding of the material and the formation of spots by reciprocable punches continuously moving in a circular path to which the strip of spot material bears tangential relation, the holding of the formed spots and the presentation thereof to heat influence for rendering the adhesive thereon tacky by use of suction plungers, and the affixing of said spots to the cap pads by use of said plungers and a spot releasing blast of air directed against said spots through said plungers.

Another object of the invention is to provide a novel spot punching turret of the character stated in which is included a plurality of pneumatic spot controlling and affixing plungers, one thereof being movable in and through each of the punches, said plungers being effective to hold

the formed spots by suction and present them to the influence of an adhesive fusing heating means, and then for pressing them in centered relation against crown cap pads and releasing them by a blast of air directed against them through the plungers.

Another object of the invention is to provide novel means for controlling the relative movements of the punches and plungers and the holding and releasing of the formed spots with respect to said plungers.

Another object of the invention is to provide novel means for permanently uniting the spots and the crown caps to which they are applied.

With these and other objects in view which will more fully appear, the nature of the invention will be more fully understood by following the description, the appended claims, and the several views illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a plan view of apparatus embodying the invention;

Fig. 2 is a vertical longitudinal section taken through the turret axes;

Fig. 3 is a detail vertical section taken along the line 2—3 of Fig. 1;

Fig. 4 is a horizontal section taken on the line 4—4 of Fig. 2;

Fig. 5 is a somewhat diagrammatic vertical section illustrating the step of punch-forming and suction-attaching the spot and the feeding of the strip of spot material by punch movement (see line 5—5 of Fig. 1);

Fig. 6 is a view similar to Fig. 5 and illustrating the presentation of spots to heat influence by use of the pneumatic plungers (see line 6—6 of Fig. 1);

Fig. 7 is a view similar to Fig. 5 and illustrates the use of the pneumatic plungers for applying the spots to the crown cap pads (see line 7—7 of Fig. 1);

Fig. 8 is a view similar to Fig. 5 and illustrates the use of an air blast during the affixing of the spots (see line 8—8 of Fig. 1).

The apparatus which I have devised in the practical development of the invention, and which is an example of mechanism adaptable to the practicing of my improved method of spotting crown caps, embodies a table 5, a punch turret A on which the center spots are formed and applied to the crown caps, a transfer turret B, and a spot setting turret C to which the assembled and center spotted crown caps are delivered by the transfer turret and on which presser

plungers engage the center spots and serve to permanently secure them to the cap pads to which they are applied.

The turrets A, B and C rotate about vertical axes above the table 5, as shown in Fig. 2, and the turret A is supported upon a shaft 6 rotatable in a bearing 7 formed in the table and in a vertically aligned bearing 8 formed in a casting 9 stationarily supported as at 10 above the table and including a ring portion 11. The turret A proper comprises a rotor 12 secured upon the shaft 6 and provided adjacent its peripheral edge with a plurality of equidistantly spaced sleeve-bushed bores vertically disposed with their axes arranged in a circle as shown in Fig. 1. Twenty such bores are shown in the drawings but it is to be understood that a greater or lesser number may be provided if desired.

A punch sleeve 14 is reciprocable in and through each turret bore 13, and each punch element cooperates with a die opening in a die ring or plate 15 removably secured to the rotor 12 as shown in Fig. 2. Each punch element also passes through an individual guard and stripper finger 16 which overlies the ring 15 in adjacent but spaced relation and which includes a vertical leg adjustably secured as at 17 in a groove 18 provided therefor in the peripheral face of the rotor 12.

At its upper end, each punch sleeve is externally threaded as at 19 and is vertically adjustable in an individual clamp head 20 carrying an actuator roller 21 movable in a cam groove 22 formed in the peripheral face of the casting ring 11. It will be obvious that by inserting a suitable tool in one of the receiving sockets 23 provided in a punch sleeve, the sleeve can be rotated to adjust the relation of its cutting end and the cooperating die plate aperture.

Each of the punch sleeves 14 carries a spot carrying and applying plunger 24 which is reciprocable in and through the sleeve bore independently of movement of said sleeve. These plungers have flared lower ends 25 and the sleeves are recessed at their lower ends to receive said flared ends. At its upper end, each plunger 24 is shouldered, and secured by an actuator nut head 26, to an individual valve block 27 having an arcuate face 28 machined to snugly engage the peripheral face of the ring 11 and partake of movements of rotation and reciprocation thereon. An air duct 29 is formed in and through each plunger 24 and its associated block 27, and these ducts are adapted to communicate, during certain intervals with a suction duct 30 formed in and extending a distance about the ring 11 as shown in Figs. 1 and 4. The suction duct is constantly evacuated through a pipe line 31 leading to any suitable exhausting mechanism (not shown). At other intervals the ducts 29 cooperate with a pressure duct 32 similarly formed in the ring 11 and connected by a pipe line 33 with any suitable source of air under pressure (not shown).

A counterbore 34 is formed in the upper end of each sleeve 14, and a spring 35 is coiled about the respective plunger 24 and engages at its respective ends with the valve block 27 and the counterbore end so as to tend to force the plunger and sleeve of the unit in opposite directions, the sleeve downwardly and the plunger upwardly. The cam groove 22 resists the downward movement of the sleeves 14, and movement upward of the plungers 24, under urge of the springs 35, is resisted by a cam ring 36 secured as at 37 upon the casting ring 11 and having a cam surface 38

engaged by the actuator nut heads 26 of the plungers for the purpose of controlling the positions of said plungers.

A crown cap feeding ring 39 is removably secured to the under face of the rotor 12 as shown in Fig. 2. The peripheral edge of the ring is notched as at 40 to receive crown caps, and the notches are so shaped and spaced that crown caps fed into the notches will be perfectly centered beneath the punch units carried by the turret. Crown caps 41 are fed to the ring notches by a delivery chute 42 leading from any suitable cap feeding mechanism (not shown). The caps rest upon a raised supporting rib 43, and a guide rail 44 may be provided to confine them in the notches 40 as they are being carried away from the cap feeding station.

It will be observed, by reference to Fig. 1, that the guide rail 44 extends about approximately 90 degrees of the circumference of the turret A, and in this sector the crown caps are fed to the turret and have the punch-formed spots applied centrally thereon by the plungers 24. At the terminus of the guide rail 44, the spotted caps are received by the turret B which transfers them to the turret C. The turret B comprises a notched ring 45 of the same character as the ring 39, but smaller, and which rotates in the same horizontal plane, being fixed upon a shaft 46 vertically rotatable in a bearing 47 formed in the table 5 and in a bearing 48 supported above said table in a manner soon to be described.

A guide rail 49 extends about 180 degrees of the transfer ring 45 and serves to hold the assembled and spotted caps in the notches of the ring from the point at which said ring receives the caps to the point at which the ring delivers the caps to the spot setting turret C.

The spot setting turret C comprises a vertically disposed shaft 50 rotatable in a bearing 51 formed in the table 5, and a rotor 52 secured on said shaft as shown in Fig. 2. This rotor is designed to provide upper and lower rings 53 equipped with a plurality of equidistantly spaced, vertically aligned bores 54 in and through which the presser plungers 55 are reciprocably mounted. Twenty such plungers are shown, but it is to be understood that this number can be varied at will without departing from the spirit of the invention. The plungers 55 are shouldered as at 56 and are constantly urged downwardly, in spot pressing relation to the crown caps, by springs 57 coiled about them between the shoulders 56 and the under face of the upper ring.

A notched ring 58 is removably secured to the under face of the rotor 52. This ring rotates in the same plane as the rings 39 and 45 of the turrets A and B and serves the same purpose of conveying and centering the crown caps beneath the plungers. While being conveyed by the turret C the caps are confined in the ring notches by a guide rail 59 which includes an overhanging ledge portion for overcoming any tendency of the caps to move upwardly with the plungers.

The spring plungers of the turret C come down on the cap spots just after they are received by the turret ring notches 40 and remain in pressing or adhesion setting engagement with them throughout approximately 270 degrees of rotation of the turret, when the plungers are again raised and the completed crown caps are stripped from the ring grooves 40 and delivered to any suitable receiving means by a stripping and delivering trackway 60.

At its upper end each plunger on the turret C 75

carries a square block 61 vertically reciprocable in a guide groove 62 in an upward extension or castellation of the upper ring 53. Each block carries a roller engageable at times by a cam portion of a track 63, the latter encircling the turret and being formed on a ring 64 supported stationarily above the table 5 as shown at 65 in Figs. 1 and 2 and in turn providing a support for the shaft bearing 48 previously referred to. The cam portion is shaped to lift the plungers over the approximately 90 degrees of turret circumference intervening the point at which the spotted caps are discharged and that at which newly spotted caps are constantly being transferred to the pressing and setting turret, and to free said plungers throughout the remainder of the turret circumference to permit the springs to press the plungers against the spotted caps.

A strip 66 of heat fusible adhesive coated foil is fed from a supply roll (not shown) by an opposed pair of positively driven feed rollers 67, one of which is cooled by a suitable chilling medium so as to prevent the foil strip becoming tacky prior to the punch-forming function thereupon. One means for so cooling the adhesive strip comprises a cooling liquid bath 68 in which the lower feed roller dips as shown in Fig. 3. Between the feed rollers 67 and the punching or spot forming station the fed strip 66 is engaged by a drag roll equipment 69 which retards the strip and provides a slack portion therein. These roller equipments present a strip portion 70 tangentially of the circle of punch units and between the die plate 15 and overlying stripper fingers 16 as shown in Figs. 1 and 3 of the drawings. The rollers 69 can be dispensed with if desired and the strip portion 70 fed at the same speed at which the punch units travel through the strip feed sector hereinafter referred to.

Beneath the table 5 a gas pipe 71 is provided, and burners 72 carried by this pipe extend above the table through suitable apertures provided to accommodate them. These burners provide a heat zone beneath the turret A and extending over the approximately 75 degrees of turret circumference just preceding the point at which the crown caps are fed to the turret ring notches 40. The punch-formed spots are presented in the heat zone in a manner soon to be described and for the purpose of having the lower heat fusible adhesive coated surface thereof rendered tacky by the heat, so that they will readily adhere to the crown cap pads when they are pressed thereagainst by the plungers 24.

The spots are punch-formed at a point in the circumference of the turret A diametrically opposite that at which the crown caps are fed in. It should be understood that the turret A rotates continuously, and in forming the spots the punch sleeves are serially reciprocated through the tangentially disposed foil strip at the place indicated. By thus reciprocating the punch units during rotation of the turret, each unit remains in the strip during an interval of travel and thus imparts a feed movement to the slack portion 70 of the strip. The cam groove 22 includes a portion so positioned and shaped as to impart the desired reciprocation to each passing punch unit, and this movement of reciprocation is so timed with respect to the movement of rotation of the turret that each feed movement imparted to the strip portion 70 exceeds only slightly the diameter of the formed spots as shown in Fig. 1. The sector of turret circumference in which the strip feed occurs is indicated at 73 in Fig. 1, and it

will be noted that the sector is centered on a line drawn radially from the center of the turret and bearing normal or right angular relation to the tangentially disposed strip portion 70. In this manner it is possible to utilize the punch units 5 to feed the strip without imparting to the strip objectionable tearing strains.

The flared head 25 of each plunger 24 engages the end of the associated punch sleeve 14 and the plungers are moved with the sleeves during each spot-punching reciprocation thereof. It will be observed by reference to Figs. 1 and 4 that the suction duct 30 in the ring 11 starts at the punching station. Thus evacuation of the plunger ducts 29 starts at this point and each spot will 15 become pneumatically attached to the punch unit plunger as it is formed.

The cam surface 38 of the cam ring 36 is so shaped that it causes the plungers 24 to start moving down out of the associated punch sleeves 20 at 74, just after the plungers have cleared the foil strip portion 70. The spot heating level is reached at 75 and the plungers are held at this level (see Fig. 6) throughout the heating zone as hereinbefore described, the heating sector being 25 indicated at 76.

At the point of introduction of the crown caps, designated 77, the plungers 24 start moving down an additional distance until the heated spots are pressed against the pads of the crown 30 caps, which first occurs at 78 (see Fig. 7), and at this point the suction duct 30 terminates and the evacuated condition of each plunger is relieved. Pressure contact between plunger and spotted crown cap is maintained throughout the 35 sector 79 and at a point in this sector the pressure duct 32 is encountered, as indicated at 80, and directs a blast of air through the plunger ducts 29 against the applied spots which aids in effectually applying the spots to the caps and in releasing them from the plungers 24. This blast 40 of air continues until after the spotted caps have been received by the transfer turret B. See Figs. 1 and 4. Just after the initiation of the air blast the plungers are elevated and remain elevated 45 until the commencement of a new cycle at the punch-forming station.

Any suitable means may be employed for imparting continuous rotation to the turrets A, B and C. As an example, I have shown a drive shaft 81 equipped with a worm 82 for imparting rotation to a worm wheel 83 carried by the shaft 50 of the turret C. Rotation of the shaft 50 may be transmitted to the turrets B and A by intermeshing spur gears 84, 85 and 86 mounted 55 respectively on the shafts 50, 46 and 6. The pitch circles of the intermeshing gears correspond with the centers over which the crown caps travel so that the respective turrets will be timed in rotation properly to receive and feed 60 the caps along.

A worm 87 may be mounted on the shaft 81 to impart rotation, through the worm wheel 88, shaft 89, worm 90 and worm wheel 91, to the strip feeding rollers 67. It is to be understood that 65 the rollers 67 merely draw off the foil strip from the supply roll and present it, as before stated, in a given relation to the punch units, thus relieving the punch units of the effort of so drawing off the strip. The real feeding of the strip, however, is occasioned by the combined reciprocatory and translatory movement of the punch units. 70

From the foregoing description, taken in connection with the accompanying drawings, it is 75

thought that the manner of practicing my improved crown cap spotting method, and the manner of constructing and operating my improved spotting apparatus will be well understood by those skilled in the art to which the invention relates.

I claim:

1. In spot forming apparatus, a circular spot forming punch unit, means for reciprocating the punch unit in the general direction of its axis for the purpose of forming spots, means for moving the punch unit in a direction other than the direction of reciprocation for translating formed spots to an assembling station, means for pneumatically holding a formed spot on said unit, and means for pneumatically expelling a formed spot from said unit.

2. In spot forming apparatus, a circular spot forming punch unit, means for reciprocating the punch unit in the general direction of its axis for the purpose of forming spots, means for moving the punch unit in a direction other than the direction of reciprocation for translating formed spots to an assembling station, said unit having an air duct therethrough, means for effecting an evacuation of said duct for holding a formed spot on said unit, and means for directing a blast of air through said duct to expel said spot from said unit.

3. In spot forming, and assembling apparatus, a punch unit, means for reciprocating the punch unit in the general direction of its axis for the purpose of forming spots, means for moving the punch unit in a direction other than the direction of reciprocation for translating formed spots to an assembling station, said unit including a punch sleeve and a carrying plunger reciprocable in and through said sleeve and having an air duct therethrough, means for evacuating said duct to pneumatically hold a formed spot on said plunger, and means for projecting said plunger from the sleeve to present the spot at said station.

4. In a spot forming, and assembling apparatus, a punch unit, means for reciprocating the punch unit in the general direction of its axis for the purpose of forming spots, means for moving the punch unit in a direction other than the direction of reciprocation for translating formed spots to an assembling station, said unit including a punch sleeve and a carrying plunger reciprocable in and through said sleeve and having an air duct therethrough, means for evacuating said duct to pneumatically hold a formed spot on said plunger, means for projecting said plunger from the sleeve to present the spot at said station and means for directing a blast of air through the duct at said station for expelling the spot from the plunger.

5. In spot forming, and assembling apparatus, a punch unit, means for reciprocating the punch unit in the general direction of its axis for the purpose of forming spots, means for moving the punch unit in a direction other than the direction of reciprocation for translating formed spots to an assembling station, said unit including a punch sleeve and a carrying plunger reciprocable in and through said sleeve and having an air duct therethrough, means for evacuating said duct to pneumatically hold a formed spot on said plunger, means providing a heated zone, means for projecting said plunger from the sleeve to position the spot in said heat zone, and means for projecting said plunger from the sleeve to present the spot at the assembling station.

6. In spot forming, and assembling apparatus, a punch unit, means for reciprocating the punch unit in the general direction of its axis for the purpose of forming spots, means for moving the punch unit in a direction other than the direction of reciprocation for translating formed spots to an assembling station, said unit including a punch sleeve and a carrying plunger reciprocable in and through said sleeve and having an air duct therethrough, means for evacuating said duct to pneumatically hold a formed spot on said plunger, means providing a heated zone, means for projecting said plunger from the sleeve to position the spot in said heat zone, means for projecting said plunger from the sleeve to present the spot at the assembling station, and means for directing a blast of air through the duct at said station for expelling the spot from the plunger.

7. In a crown cap spotting machine, a rotatable turret having a guide bore in an edge portion thereof, a punch sleeve reciprocable in and through said bore, a die plate carried by said turret and engageable by said punch, a carrier plunger reciprocable in and through said sleeve and having an air duct therethrough, means for moving the sleeve and plunger in timed relation, and means for evacuating the duct in said plunger to retain a punched spot against the end of said plunger.

8. In a crown cap spotting machine, a rotatable turret having a guide bore in an edge portion thereof, a punch sleeve reciprocable in and through said bore, a die plate carried by said turret and engageable by said punch, a carrier plunger reciprocable in and through said sleeve and having an air duct therethrough, means for moving the sleeve and plunger in timed relation, means effective during a portion of the rotation of the turret for evacuating the duct in said plunger to retain a punched spot against the end of said plunger, and means effective during another portion of the rotation of the turret to direct a blast of air through said duct to expel the previously retained spot from said plunger.

9. In a crown cap spotting machine, a rotatable turret having a plurality of guide bores disposed equidistantly in a circle about the edge portion of the turret, a punch sleeve reciprocable in and through each bore, a die plate carried by said turret and having die holes therein to receive the punch sleeves, means carried by the turret for centering a crown cap beneath each punch sleeve, a carrier plunger reciprocable in and through each sleeve and each having an air duct therethrough, means for moving the sleeve and plunger in timed relation to form spots and then carry the formed spots to an assembling station and then apply them to crown caps, and means for evacuating the plunger ducts during the spot carrying intervals.

10. In a crown cap spotting machine, a rotatable turret having a plurality of guide bores disposed equidistantly in a circle about the edge portion of the turret, a punch sleeve reciprocable in and through each bore, a die plate carried by said turret and having die holes therein to receive the punch sleeves, means carried by the turret for centering a crown cap beneath each punch sleeve, a carrier plunger reciprocable in and through each sleeve and each having an air duct therethrough, means for moving the sleeve and plunger in timed relation to form spots and then carry the formed spots to an assembling station and then apply them to crown caps, means for

evacuating the plunger ducts during the spot carrying intervals, and means for directing a blast of air through the plunger ducts during the spot applying intervals.

11. In a crown cap spotting machine, a rotatable turret having a guide bore in an edge portion thereof, a punch sleeve reciprocable in and through said bore, a die plate carried by said turret and engageable by said punch, a carrier plunger reciprocable in and through said sleeve and having an air duct therethrough, means for moving the sleeve and plunger in timed relation, and means for evacuating the duct in said plunger to retain a punched spot against the end of said plunger, said sleeve and plunger moving means including spring means tending to move the plunger and sleeve of each plunger and sleeve unit in opposite directions, and cam means engageable with said plungers and sleeves for moving them in opposition to said spring means.

12. In a crown cap spotting machine, a rotatable turret having a plurality of guide bores disposed equidistantly in a circle about the edge portion of the turret, a punch sleeve reciprocable in and through each bore, a die plate carried by said turret and having die holes therein to receive the punch sleeves, means carried by the turret for centering a crown cap beneath each punch sleeve, a carrier plunger reciprocable in and through each sleeve and each having an air duct therethrough, a punch and plunger control ring stationarily supported above the turret and having a pneumatic duct in a portion of the periphery thereof, a valve block carried by each plunger and slidable on said ring for controlling communication between the plunger and ring ducts, spring means interposed between each punch sleeve and the valve block of its associated plunger and tending to move said plunger and sleeve in opposite directions, and cam means carried by the ring and engaged by said plunger and sleeve elements for effecting movement of said elements in opposition to said spring means to form spots and then carry the formed spots to an assembling station and then apply them to crown caps.

13. In a crown cap spotting machine, a rotatable turret having a plurality of guide bores disposed equidistantly in a circle about the edge portion of the turret, a punch sleeve reciprocable in and through each bore, a die plate carried by said turret and having die holes therein to receive the punch sleeves, means carried by the turret for centering a crown cap beneath each punch sleeve, a carrier plunger reciprocable in and through each sleeve and each having an air duct therethrough, a punch and plunger control ring stationarily supported above the turret and having circumferential suction and blast ducts in the periphery thereof and aligned in a common plane, a valve block carried by each plunger and slidable on said ring for controlling communication between the plunger and ring ducts, spring means interposed between each punch sleeve and the valve block of its associated plunger and tending to move said plunger and sleeve in opposite directions, and cam means carried by the ring and engaged by said plunger and sleeve elements for effecting movement of said elements in opposition to said spring means to form spots and then carry the formed spots to an assembling station and then apply them to crown caps, said suction duct being positioned to evacuate the plunger ducts during carrying of the spots, and said blast duct being positioned to direct a blast

of air through the plungers at the assembling station.

14. In a crown cap spotting machine, a rotatable turret having a guide bore in an edge portion thereof, a punch sleeve reciprocable in and through said bore, a die plate carried by said turret and engageable by said punch, a carrier plunger reciprocable in and through said sleeve and having an air duct therethrough, means for moving the sleeve and plunger in timed relation, means for evacuating the duct in said plunger to retain a punched spot against the end of said plunger, and means for effecting longitudinal adjustments of the plunger and sleeve relation.

15. In a crown cap spotting machine, a horizontally rotatable turret having a plurality of guide bores equidistantly spaced and vertically disposed in a circle about the edge portion of the turret, a punch sleeve reciprocable in and through each bore, a die plate carried by the turret and having die holes therein to receive the punch sleeves, means carried by the turret for centering a crown cap beneath each punch sleeve, a carrier plunger reciprocable in and through each sleeve and each having an air duct therethrough, means for presenting a strip of spot material over the die plate tangentially of and beneath the circle of punch sleeves, means for continuously rotating the turret, means for reciprocating the sleeves serially through the strip into the die plate to form spots and feed the strip, means for evacuating each plunger duct as a spot is formed to hold the spot on the plungers, means forming a heat zone beneath a sector of the die plate, means for projecting the plungers through the die plate to position the spots in the heat zone, means to feed crown caps to the centering means, means for moving the plungers to apply the spots to the caps, and means to direct a blast of air through the plunger ducts during application of the spots.

16. In a crown cap spotting machine, a horizontally rotatable turret having a plurality of guide bores equidistantly spaced and vertically disposed in a circle about the edge portion of the turret, a punch sleeve reciprocable in and through each bore, a die plate carried by the turret and having die holes therein to receive the punch sleeves, means carried by the turret for centering a crown cap beneath each punch sleeve, a carrier plunger reciprocable in and through each sleeve and each having an air duct therethrough, means for presenting a strip of spot material over the die plate tangentially of and beneath the circle of punch sleeves, means for continuously rotating the turret, means for reciprocating the sleeves serially through the strip into the die plate to form spots and feed the strip, means for evacuating each plunger duct as a spot is formed to hold the spot on the plungers, means forming a heat zone beneath a sector of the die plate, means for projecting the plungers through the die plate to position the spots in the heat zone, means to feed crown caps to the centering means, means for moving the plungers to apply the spots to the caps, means to direct a blast of air through the plunger ducts during application of the spots, a continuously rotating spot setting turret including a ring of setting plungers and means for elevating the plungers to receive and discharge spotted caps and spring devices for at other times holding said setting plungers against the spotted caps, and means for transferring the spotted caps from the first to the second mentioned turret.

17. In a crown cap spotting machine, a mov-

- able turret, punch units movable with the turrets and each having a duct opening through the end thereof, means disposing a fusible adhesive coated material in position for being engaged by said
- 5 units, means for moving the units to form spots from said material, means for feeding crown caps to position for engagement by said units, means for at times evacuating the unit ducts and for at
- 10 times causing a blast of air to pass through said ducts to alternately effect attachment of the spots to the units and detachment of the spots from the units, means for applying heat to soften the fusible adhesive, and setting pressure applying means.
- 15 18. In apparatus of the character described wherein is provided a spot forming station, a crown cap and spot assembling station and a heat zone between said stations; spot forming punch means, means for actuating the punch means for forming a center spot at the forming station, means for pneumatically holding a formed spot on the punch, means for moving the punch means and the spot thereon through the heat zone to the assembling station, means for pressing the punch means against a crown cap at the assembling station to affix the spot thereto, and means for pneumatically aiding the pressing of the spot against the crown cap at said assembly station.

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