Jan. 4, 1938. A. J. FISHER 2,104,224

CAN HEADING MACHINE

Filed Jan. 31, 1935 3 Sheets-Sheet 1

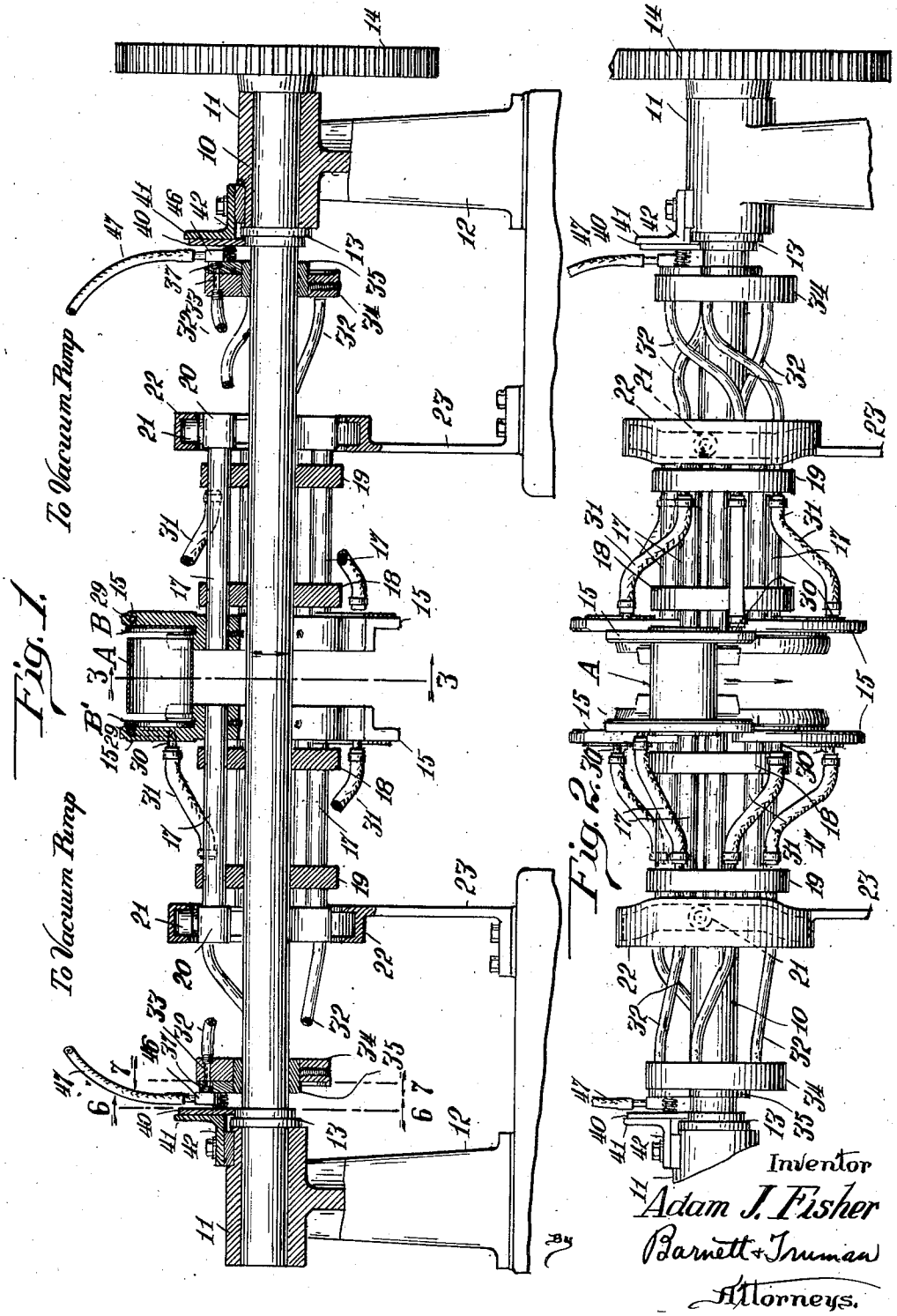


Fig. 1.

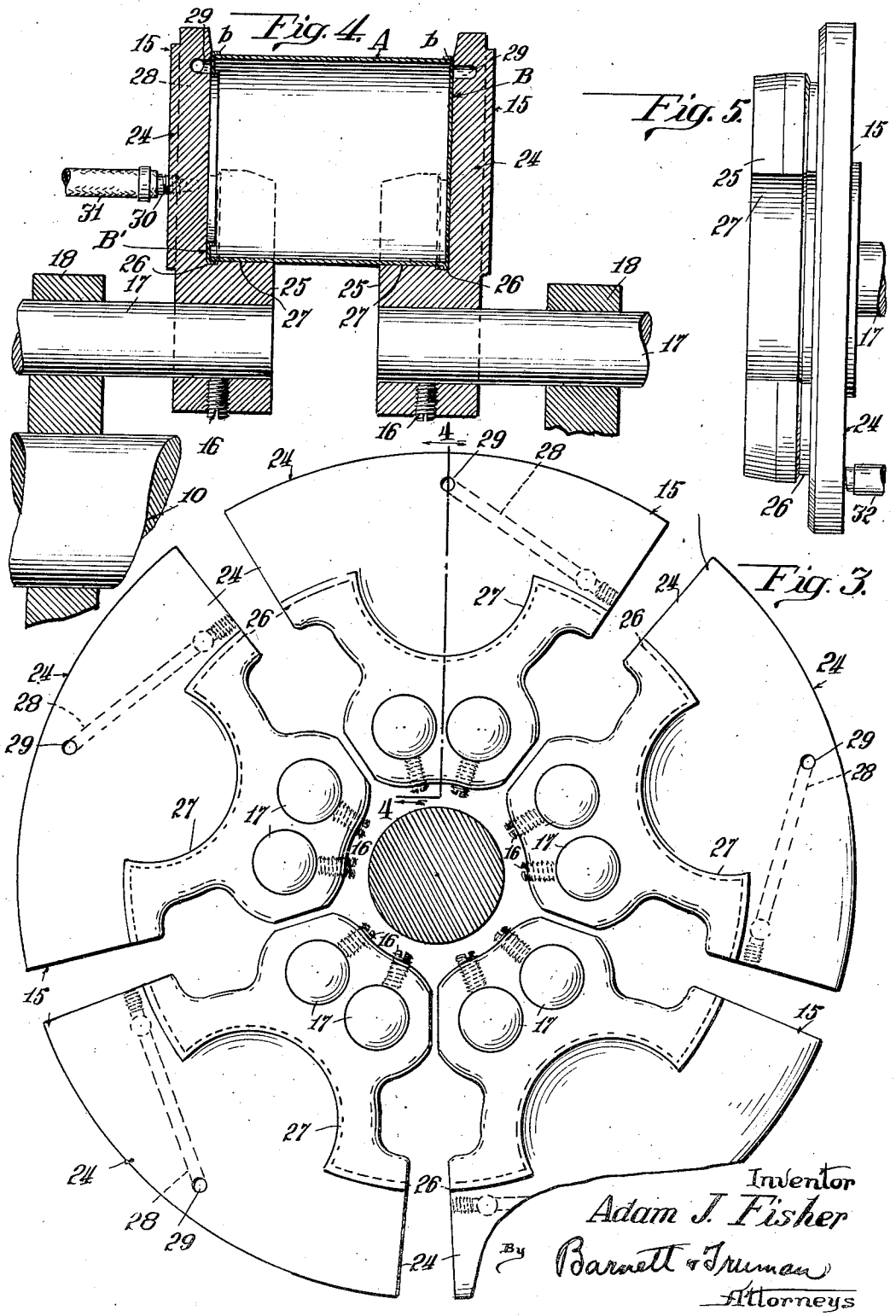
Fig. 2.

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Jan. 4, 1938. A. J. FISHER 2,104,224

CAN HEADING MACHINE

Filed Jan. 31, 1935 3 Sheets-Sheet 2



Jan. 4, 1938. A. J. FISHER 2,104,224

CAN HEADING MACHINE

Filed Jan. 31, 1935 3 Sheets-Sheet 3

Fig. 6.

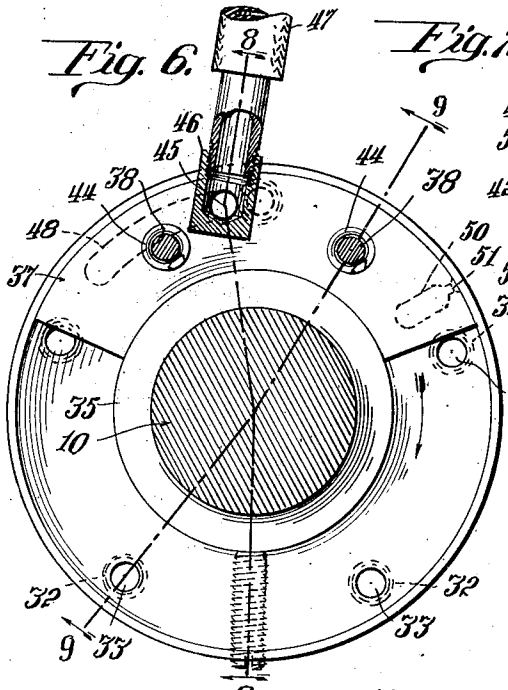


Fig. 7.

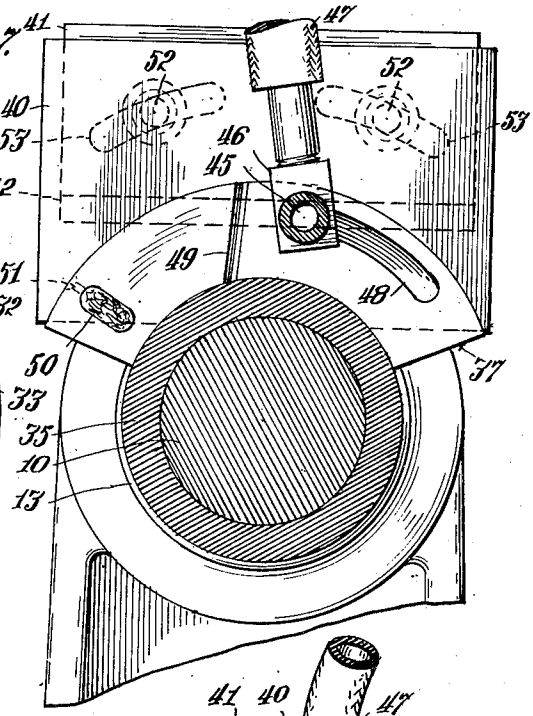


Fig. 8.

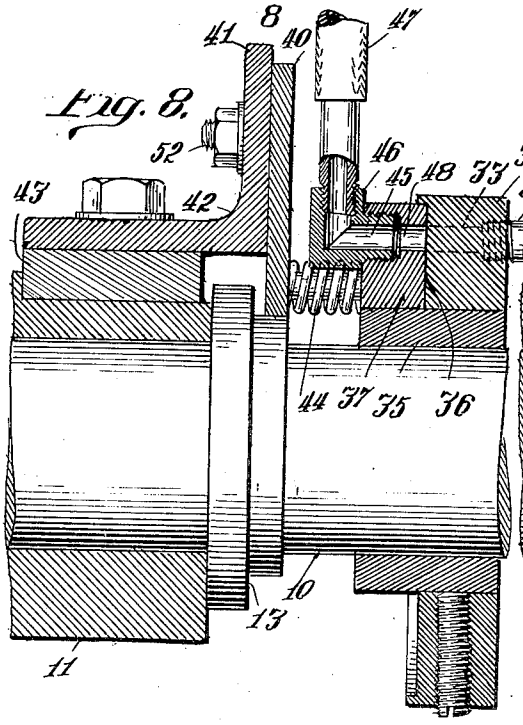
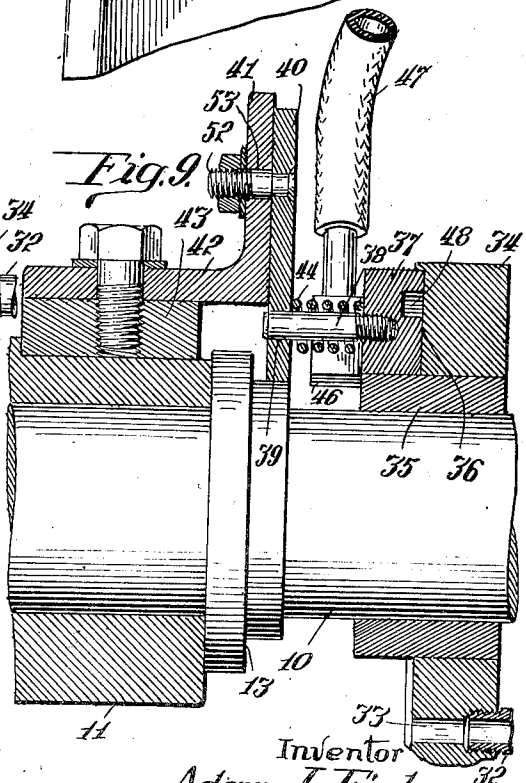


Fig. 9.



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UNITED STATES PATENT OFFICE

2,104,224

CAN HEADING MACHINE

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Application January 31, 1935, Serial No. 4,299

7 Claims. (Cl. 113—30)

This invention relates to can heading machines, and a primary object of the invention is to provide improvements for insuring accuracy in the application of the flanged heads of the cans to the can bodies.

A further specific object of the invention is to provide an improved can heading machine which makes it practicable to apply to can bodies, head members having flanges which stand substantially at right angles to the disc portions of the heads instead of having the flanges oblique or flared as has been customary. With right angle flanges the fit of the heads on the can body is closer and more secure, less solder is required and leaking joints are practically eliminated.

With these objects in view, the machine, according to the present invention, is provided with means for producing suction on the can heads which holds them against the movable members by which the heads are brought to and forced upon the ends of the can bodies.

The invention is illustrated in a preferred embodiment in the accompanying drawings, wherein:

Fig. 1 is a longitudinal, vertical sectional view through the heading machine, improved in accordance with the present invention.

Fig. 2 is a side elevation of the machine.

Fig. 3, a vertical, sectional view on line 3—3 of Fig. 1.

Fig. 4 is a sectional view on line 4—4 of Fig. 3.

Fig. 5 is a plan view of the right hand can head and body supporting member shown in Fig. 4.

Fig. 6, a vertical, sectional view on line 6—6 of Fig. 1.

Fig. 7, a similar view on line 7—7 of Fig. 1, looking in the opposite direction.

Fig. 8, a sectional view on line 8—8 of Fig. 6; and

Fig. 9 is a sectional view on line 9—9 of Fig. 6.

The can heading machine to which, for the purpose of illustration, the improvement of the present invention has been shown as applied, in the drawings, is a machine of known type. Generally speaking, it consists of a horizontal rotating shaft to which is fixed a structure for supporting, in circular arrangement, a plurality of can bodies, indicated in the drawings by the letter A, and can heads B, B′ which are to be applied to the bodies; this structure comprising a plurality of pairs of supporting or heading members, the members of each pair being movable toward each other, one pair operating after another to force the flange can heads upon the ends of the body being then moved away from each other to release the cans one after another for discharge from the machine. As this much of the machine is in common use, in order to simplify the drawings, certain parts of the apparatus, such as the means for feeding the can elements to the machine and the means for holding them in the machine have been omitted from the drawings.

Referring now to the drawings, 10 designates the main shaft of the machine which is mounted in bearings 11, 11 on the uprights 12, 12; is provided with collars 13, 13 to prevent end movement of the shaft; and is rotated by suitable gearing, one gear 14 of which is shown in Figs. 1 and 2.

The structure for movably supporting and assembling the can elements comprises a plurality of pairs of heading members 15, the drawings showing five such pairs (Fig. 3). The number might be larger or smaller. Each of said members has attached thereto, by set screws 16 (Fig. 3), a pair of push rods 17, 17 which extend slidably through openings in the guide collars 18, 18, 19, 19 rigidly secured to the shaft 10. The rods of each pair are secured to a cross-head 20 and the several crossheads are provided with rollers 21. The rollers 21 extend into box cams 22, 22, the five rollers on one side of the machine into one cam and five on the other side into the other cam; the cams being carried on vertical supports 23. The cams 22, 22 are so formed that as shaft 10 revolves (in the direction of the arrow, Fig. 1) the heading members 15 of the several pairs of heading members are moved toward each other, successively, to force the heads on the can bodies.

The can bodies and heads are fed into the machine and are held in place by known means (not shown). The heads instead of being provided with flared flanges, a construction required in some capping machines, are formed with flanges *b* which are substantially at right angles to the disc portions of the heads. When the heads have been forced upon the bodies, the assembled can structures are released and discharged from the machine.

The heading members are preferably in the form shown in detail in Figs. 3, 4 and 5. Each member consists of a plate 24 provided with an inward extension 25 formed with a groove 26 for the flange *b* of a can head, and a recess 27 to receive one end of the can body A.

So much of the machine, as above described, is of known construction. Some difficulty, however, has been experienced in bringing the can heads into accurate engagement with the bodies.

The can heads are flanged and are intended to make a close fit with the bodies. It sometimes happens that a slight tilting of the head or other inaccuracy in the position of the can head on the heading member will result in the failure of the head to be driven properly on the body with possible crushing of the can elements.

To obviate this evil the present invention provides means for holding the can head against the plate portion **24** of the supporting member **15** during the movement of the heading members toward the can body. To this end, each of the members **15** is formed with a duct **28** opening through the face of said member at **29** and terminating at the other end in a nipple **30** for a flexible hose **31** which is connected to a pipe **32** (Figs. 1 and 2) that leads to a duct **33** in a valve element **34** secured to a collar **35** fixed to shaft **10** (Figs. 6 to 9). It will be understood that each of the five can heading members **15** on each side of the machine is thus connected to the rotating valve element **34**, there being two valves, one at each end of the shaft **10** (Figs. 1 and 2). Bearing against the outer face **36** of the rotating valve element **34** is a non-rotating valve element **37** of arcuate shape (Fig. 7) to which is secured a guide stud **38** extending through an opening **39** in a plate **40** (Figs. 8 and 9) secured to the upstanding flange **41** of an angle bar **42** which is fastened to a seat member **43** on the bearing **11** for the shaft **10**. A spring **44** is interposed between the non-rotating valve element **37** and plate **40** which keeps the valve elements in contact with each other. The valve element **37** is formed with a duct **45** to which is screwed an elbow-shaped nipple **46** (Fig. 8) for a hose **47** which latter is connected to a vacuum pump or other source of low pressure. The inner face of valve element **37** is provided with an arcuate groove **48**, forming a part of the duct **45**, with which groove the five ducts **33** in the valve element **34** are adapted to register as the shaft **10** rotates. These ducts are so positioned and the groove **48** of such length that, in the case of each of the five heading devices (each pair of members **15**) the suction is applied to the outer face of the head as soon as the head has been put in place in member **15**, and this suction is maintained during the operative or inward movement of the heading members, the duct **33** passing over the end of the extension groove **48** of duct **45** at the completion of the heading operation. If desirable for mechanical reasons there might be two ducts **45**, one closer to the axis than the other, and alternate ducts arranged to come into register with the ducts **45** respectively. The ends of ducts **33** after leaving groove **48** pass over a vacuum releasing groove or port **49** (Fig. 7), which breaks the vacuum against the can head, in each case, before the heading member begins its outward movement. Preferably the valve member **37** is formed with pocket **50** for absorbent material which receives oil through oil opening **51**. For the purpose of adjustment, the plate **40** is secured to the angle bar **42** by bolts **52** which extend through arcuate slots **53** in the flange **41** of the angle bar.

The can head, it will be observed, is held at the bottom (referring to the position of the head when first fed into the machine) by being seated in groove **26** (Fig. 5). The vacuum is applied, preferably, at the opposite edge of the head, as shown in Fig. 4, so that the head is accurately positioned on the heading member and is held in this position during the heading operation.

It is realized that this invention could be made applicable to can heading machines of different construction from that shown; and the invention is to cover all embodiments and modifications of the invention within the scope of the appended claims.

I claim:

1. In a can heading machine, the combination of a rotating shaft; can supporting means on the shaft and rotatable therewith comprising a supporting abutment member for one end portion of the can body and a heading member for supporting the other end of the can body and the head to be applied thereon, there being a vacuum duct opening through a portion of the heading member in close relation to the can head supported thereon; a valve element having a fixed position on said shaft and rotatable therewith and formed with a vacuum duct; a tubular connection between said last named duct and the vacuum duct in the heading member; a non-rotating valve element arranged against the rotating valve element and having an elongated vacuum duct with which the duct in the rotating valve element registers during a predetermined rotational movement of said shaft; and means for moving the heading member lengthwise of said shaft, during the registry of said vacuum ducts of said valve members, to force the can head upon the can body.

2. In a can heading machine, the combination of a rotating shaft; can supporting means on the shaft and rotatable therewith comprising a supporting and abutment member for one end portion of the can body and a heading member for supporting the other end of the can body and the head to be applied thereon and movable lengthwise of the shaft, during a partial rotation thereof, to force the head upon the can body, there being a vacuum duct opening through a portion of the heading member in close relation to the can head supported thereon; a valve element having a fixed position on said shaft and rotatable therewith and formed with a vacuum duct; a tubular connection between said last named duct and the vacuum duct in the heading member; a non-rotating valve element arranged against the rotating valve element and having an elongated vacuum duct with which the said duct in the rotating valve element registers during a predetermined rotational movement of said shaft and formed also with a vacuum releasing port over which the end of the duct in the rotatable valve element passes after passing said elongated duct.

3. In a can heading machine the combination of a rotating shaft; can supporting means on the shaft and rotatable therewith comprising a supporting and abutment member for one end portion of the can body and a heading member for supporting the other end of the can body and the head to be applied thereon, there being a vacuum duct opening through a portion of the heading member in close relation to the head supported thereon; a valve element having a fixed position on said shaft and rotatable therewith and formed with a vacuum duct; a flexible tubular connection between said last named duct and the vacuum duct in the heading member; a non-rotating valve element movable lengthwise of the shaft, a spring for pressing the said valve element against the rotary valve element to make an air-tight connection between them, there being an elongated vacuum duct with which the duct in the rotating valve element registers dur-

ing a partial rotation thereof; and means for moving said heading member lengthwise of said shaft, during the registering of the vacuum ducts of said valve members, to force the can head upon the can body.

4. In a can heading machine, revoluble can supporting means comprising a supporting and abutment member for one end portion of a can body and a heading member for supporting the other end of the can body and the can head to be applied thereon, there being a groove in the heading member to receive the lower edge portion of the can head and there being also a vacuum line opening through a face of the heading member against which face the can head is adapted to bear, and means interposed in the vacuum line for making and breaking vacuum connections in that portion of the line which opens through said face of the heading member so as to hold a can head against and subsequently release it from said face of the heading member; said means comprising a valve member revoluble in timed relation with the heading member and having a port therein which is open to the atmosphere during a partial rotation of the valve member, and a fixed valve member having a vacuum port therein adapted to communicate with the port in the revoluble valve member during another portion of said rotational movement.

5. In a can heading machine, the combination of an element for supporting one end portion of a can and providing an abutment therefor, unitary means for supporting the other end of the can body and a can head therefor, said unitary means comprising a member movable relative to the abutment element to move the can head upon the body, and means for applying suction force to the can head to hold it against said unitary member during the movement of said head onto the can body.

6. In a can heading machine, the combination of means for supporting the opposite ends of a can body and head members to be applied thereto comprising members movable toward each other to move the head members into assembled relation on the body, and means comprising suction lines opening through the can supporting members for holding said head members of the can against said supporting means during the said movement of the supporting members toward each other, whereby the can heads are held against the supporting members during the application of said heads to the can body.

7. In a can heading machine, the combination of means for supporting the can body in a horizontal position comprising a supporting and abutment member for one end of the can body, a movable member for supporting the other end portion of said body and for movably supporting the can head in vertical position, means for moving the last mentioned supporting member to and from the first mentioned supporting member, and means for applying suction to the can head to hold it against said movable member during the application of said head to the can body.

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