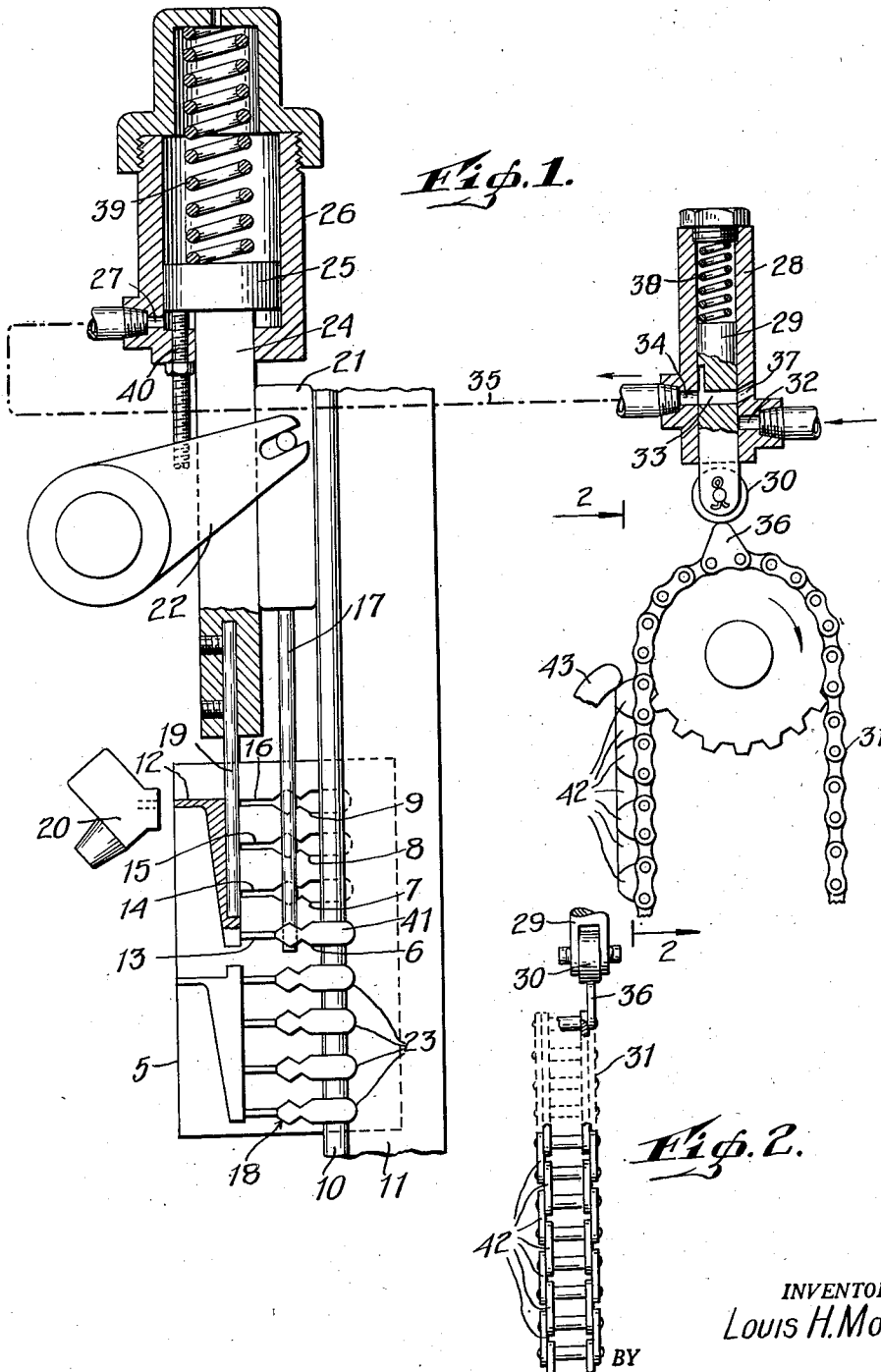


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L. H. MORIN
DIE CASTING MACHINE
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DIE-CASTING MACHINE

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Application March 25, 1944, Serial No. 528,121,
which is a division of application Serial No.
460,067, September 29, 1942. Divided and this
application January 26, 1945, Serial No. 574,698

2 Claims. (Cl. 18—30)

1

This invention relates to the formation of what are known as stringer lengths in the production of separable fasteners of the type employing stringers coupled and uncoupled by a slider movable along the stringers. More particularly, the invention deals with a machine for casting a successive series of scoops with means for decreasing the number of scoops cast in one series in producing predetermined stringer lengths or stringers having a predetermined number of scoops thereon. Further, the invention includes means for spacing stringer lengths on the mounting strand or tape in a continuous automatically operating machine, whereby a predetermined number of stringer lengths may be produced on a single strand or tape.

The novel features of the invention will be best understood from the following description when taken together with the accompanying drawing, in which certain embodiments of the invention are disclosed, and in which the separate parts are designated by suitable reference characters in each of the views, and in which:

Fig. 1 diagrammatically illustrates a machine made according to my invention with parts of the construction broken away and in section; and

Fig. 2 is a diagrammatically detailed view of a part of the construction illustrated in Fig. 1, and looking in the direction of the arrows 2—2 of Fig. 1.

This application constitutes a division of application 528,121, filed March 25, 1944, which application in turn is a division of application 460,067, filed September 29, 1942.

In the formation of separable fastener stringers of the type and kind under consideration, particularly in die casting a series or multiple of scoops on a mounting member, it has been difficult to produce stringers of the required length. For example, let us assume that four scoops are cast in each operation of the machine. In such case, if 16 scoops were desired on the resulting stringer, 4 casting operations would suffice to produce this stringer. If, however, a stringer, let us say, of 17 scoops was required, it would be necessary to cast stringers of 20 scoop lengths, and then remove 3 of the scoops.

The above objectionable features not only necessitates undue waste of time and labor, but also a waste in material and further results in the production of makeshift partially marred stringers involving the difficulty of removing the cast material from the interstices of the braid of the mounting member.

2

The above objection is overcome by the machine or apparatus herein disclosed which employs means whereby the last series of castings in producing a predetermined stringer length may be modified to the extent of eliminating any desired portion of the series of scoops, for instance, when casting in series of 4, to eliminate 1, 2 or 3 of the 4 scoops.

In considering the diagrammatic illustration of the machine or apparatus of this application, it is well to bear in mind that an automatic die casting machine, such for example, as that disclosed in Patent 2,244,424 of June 3, 1941, may be utilized. The spacing between the series of scoops for each stringer along the strand, tape or other mounting so that each mounting may be subdivided to produce separate stringers, may be obtained by utilizing, in whole or in part, mechanism such as is shown in my prior Patents 2,224,980 of December 17, 1940, and 2,228,145 of January 7, 1941. The drawing diagrammatically illustrates a form of mechanism which may be used in carrying out my invention, though it is obvious that other forms may be used and that, if desired, some of the steps of my method could be carried out by hand.

In Fig. 1, 5 represents a die or at least the face view of one part of a die having a series of impressions or cavities 6, 7, 8 and 9 therein to form a corresponding number of scoops of a separable fastener stringer. These scoops are formed at spaced intervals along the beaded edge 10 of a tape 11 or other mounting member also supported between the dies of the machine.

Also formed on the parting line of the dies is a large gate 12 having individual branches or runners 13, 14, 15 and 16, leading to the independent impressions or cavities 6 to 9 respectively.

Also arranged on the parting line of the die, and paralleling the bead 10 of the tape, is a core pin 17, on which the scoops are cast and by which the scoops are fed from the casting position shown at the top of Fig. 1 to the lowered position indicated at 18, in the formation of successive series of castings. Also on the parting line of the die and extending into the gate 12 is a selecting core 19, which acts as a valve to control the various runners 13, 14, 15 and 16 leading to the impressions or cavities 6, 7, 8 and 9 for purposes later described.

At 20 is indicated the discharge end of the nozzle of a casting machine through which casting material is pressure injected into the dies to fill the cavities or impressions 6 to 9 or such portion

of these cavities as may not be shut off by the selecting core 19. Obviously, any suitable metallic or plastic material may be used.

The core pin 17 is mounted in a slide 21 which is actuated through a lever 22, in feeding the cast series to the position 18, in which position they are held by an impression in the dies 5 conforming to the complete casting as indicated in the drawing. The core pin 17 is stripped from the scoops 23 by the partial closing of the dies 5 to engage the scoops.

Obviously, the selecting core 19 could be moved manually to close off as many of the runners 14, 15 and 16 as may be desired in any particular casting operation, but preferably this core will be moved automatically. For this purpose, I have shown the selecting core 19 as mounted on a slide 24 having at its upper end a piston 25 which operates in an air cylinder 26. Air is admitted into the cylinder 26 below the piston through a port 27, and this air supply is controlled by a valve 28. In the valve 28 is a valve stem or plunger 29 carrying at its outer end a roller 30 which operates upon the links of a control chain 31. The valve 28 has an inlet port 32 communicating with a source of compressed air supply. In the stem 29 is a passage 33 to place the port 32 in communication with a discharge port 34 which communicates with the port 27 through a pipe or tube indicated by the line 35. The above communication is established when the roller 30 operates upon the normal links of the chain 31. However, the stem 29 is raised by a tripping lug 36 to close the port 32 and to bring the passage 33 in communication with an exhaust port 37 to exhaust the air from the cylinder 26. A spring 38 supports the roller 30 in constant engagement with the chain 31.

When the air is released from the cylinder 26, the piston 25 is depressed by a spring 39 to move the piston into engagement with an adjustable stop screw 40 or similar control. In the present diagrammatic illustration, the screw 40 is adjusted to a position to check downward movement of the piston 25 to the extent to close all of the branches or runners 14, 15 and 16 by the core 19, leaving the runner 13 open, so that, in the next casting operation, a single scoop 41 will be formed in the cavity 6. This means that a single scoop is added to any multiple of the series of 4 castings made in producing a given stringer length. For example, if 17 scoops are required, there will be 4 castings of the 4 series of scoops and the added single cast scoop 41. If 18 scoops are required, then the screw 40 would be adjusted to expose the runners 13 and 14 to form scoops in the cavities 6 and 7 and, if 19 are required, the added runner 15 would be exposed to form a casting in the cavity 8.

At this time it is well to point out that in forming stringer lengths, a predetermined number of stringers of one length are made to fill a predetermined order, and after the machine is once set by the adjustment of the screw 40, the machine will continue to automatically produce all of the required stringers of the one predetermined or desired length. In proceeding to produce a quantity of another stringer length, suitable adjustments will be made, as will be apparent.

The control chain 31 is made of such length as to control and regulate the particular stringer to be produced and this chain will have one of the trips 36 thereon to timely actuate the valve in exhausting the air from the cylinder to allow the core 19 to drop into its control position. Intermediate this tripping period, the valve is sup-

ported in position to maintain air in the cylinder, thus supporting the core 19 in raised position.

Also provided on the chain 31 are one or more other trip lugs 42, with which a lever or other control 43 operates in controlling the wide spacing of the tape or other mounting 11, to space one stringer length from another in accordance with the teachings in the patents hereinbefore cited. In this connection, and bearing in mind that two controls are employed on the chain 31, the trip 36 will be arranged at one side of the chain, whereas the trips 42 will be arranged at the other side thereof, as diagrammatically illustrated in Fig. 2 of the drawing.

It will, of course, be apparent that the present diagrammatic illustration is simply to indicate one adaptation of the invention, as the scoops may be cast in any desired multiple, that is to say, two or more. While one type or form of scoop is shown, this again is simply to illustrate one adaptation of the invention.

Considering my present invention generally, it may be said to comprise a machine or apparatus, wherein a plurality or series of castings are formed normally in each casting operation of the machine and these series of castings are repeated in a controlled series of casting operations and then, in one casting operation, only a part of the series of castings is formed, particularly when all of the castings in one cycle will not make up the required number of castings in what might be termed a group of castings. The final casting operation of the machine reduces the number of castings formed to make up the exact number of castings required in a group.

From this standpoint, it will be apparent that in the art of producing die castings, it will be possible to control group formation of castings for any desired purpose, that is to say, for boxing, sorting and the like. Here again it is also to be borne in mind that it is not essential that the castings be formed on a mounting member and, in other instances, the mounting member, if employed, may simply constitute a means for supporting or retaining each group of castings in a coupled or united relationship.

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

1. In a die casting machine having a pair of dies with a plurality of cavities therein, an automatic control mechanism for controlling formation of castings in the cavities of said dies, a member supported between the dies and movable relatively thereto to control exposure of the cavities to material injected into the dies, a cylinder, a plunger in said cylinder and extending through one end thereof, the extended end of the plunger supporting said member, a long adjustment screw on the cylinder and cooperating with said plunger, adjustment of said screw controlling movement of said plunger and member to control exposure of the cavities for reception of casting material injected into the dies, spring means normally supporting said plunger in engagement with said screw, and means admitting air, under pressure, to the cylinder to move the plunger, with the member thereon, against the action of said spring means to expose all of the cavities of the dies for reception of casting material.

2. In a die casting machine having a pair of dies with a plurality of cavities therein, an automatic control mechanism for controlling formation of castings in the cavities of said dies, a member supported between the dies and movable

relatively thereto to control exposure of the cavities to material injected into the dies, a cylinder, a plunger in said cylinder and extending through one end thereof, the extended end of the plunger supporting said member, a long adjustment screw on the cylinder and cooperating with said plunger, adjustment of said screw controlling movement of said plunger and member to control exposure of the cavities for reception of casting material injected into the dies, spring means normally supporting said plunger in engagement with said screw, said last named means including a plunger valve, and means automatically tripping said valve to exhaust air from the cylinder in the operation of said plunger by said spring means.

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