

May 26, 1942.

A. SCHMIDT

2,284,072

TAMPING MACHINE

Filed April 6, 1939

2 Sheets-Sheet 1

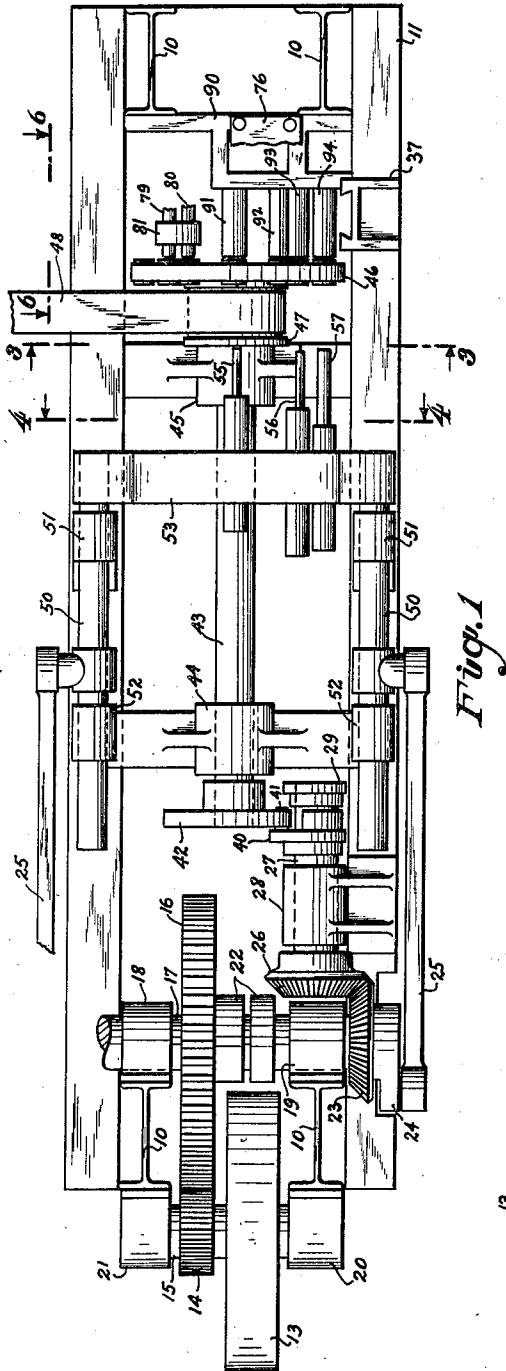


Fig. 1

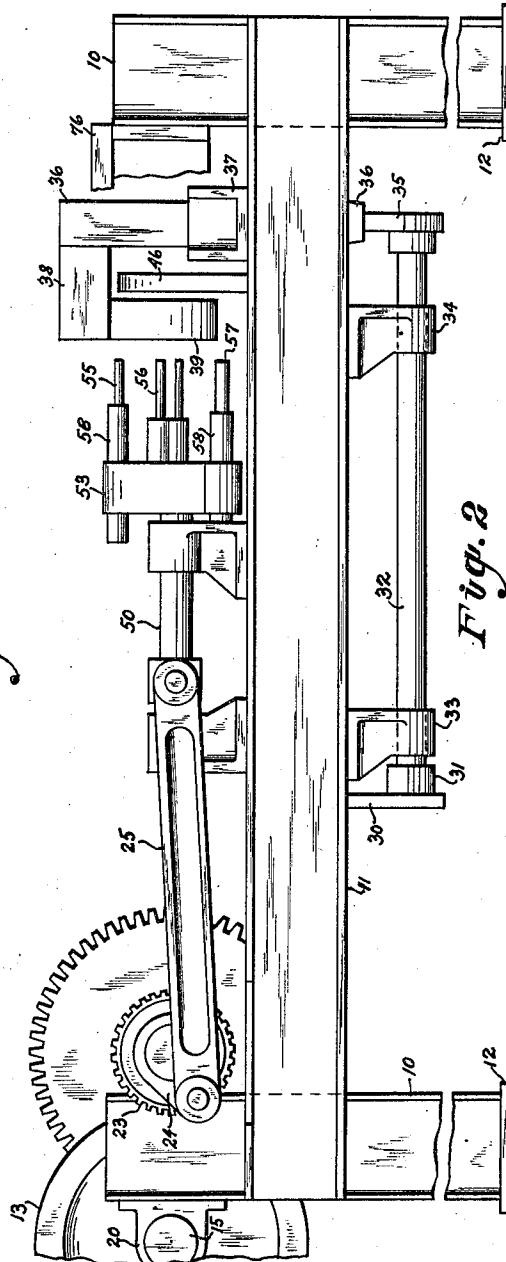


Fig. 2

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2 Sheets-Sheet 2

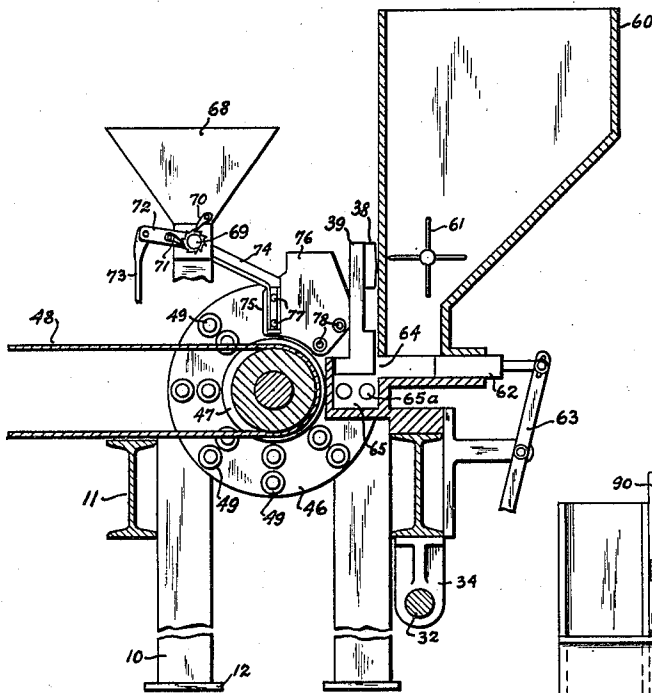


Fig. 3

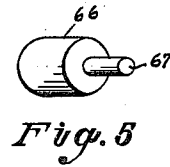


Fig. 5

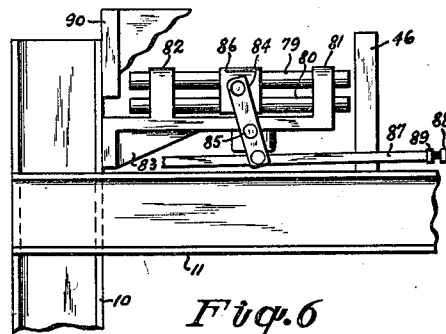


Fig. 6

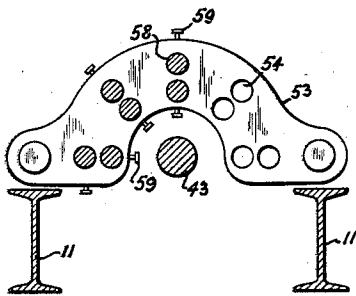


Fig. 4

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2,284,072

TAMPING MACHINE

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3 Claims. (Cl. 18—5)

My invention relates to improvements in tamping or stamping machines of the type which are used extensively in various industries for the automatic molding of plastic or other powders into various forms, as well as for the pre-forming of definite amounts of such plastic powders preliminary to the actual molding process.

Machines of this type have formerly had a revolving turret with a sliding crosshead performing the injecting and ejecting operations from one side of the turret. There has also been a mechanically operated tamping hammer which has been hand fed and it was always necessary to take off the finished product by hand. In the present invention has been added a new automatic feed of the powder and automatic ejecting means on the rear of the turret which permits the taking off of the finished product directly upon a belt conveyor, thus permitting continuous automatic operation at a much greater rate of production. While formerly the turret was driven by a four-point Geneva drive the present invention utilizes an eight-point drive as well as multiple dies in the turret permitting a large increase in the rate of production. Other new improvements are to be found in the double drive of the crosshead and in the welded frame construction.

An important object of the invention is to provide a tamping machine permitting a larger rate of production at a lower cost.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings, forming part of this specification, and in which like numerals are employed to designate like parts throughout the same—

Figure 1 is a plan view of the machine,

Figure 2 is a side elevation of the same,

Figure 3 is a sectional elevation along line 3—3 in Figure 1,

Figure 4 is a partial section along line 4—4 in Fig. 1,

Figure 5 is a perspective view of a bobbin, and,

Figure 6 is a partial elevation along line 6—6 in Figure 1.

In the drawings, wherein for the purpose of illustration, is shown a preferred embodiment of my invention, the numeral 10 designates the vertical I-beams forming part of the welded frame construction and providing the four legs upon which the machine stands. The vertical I-beams 10 are welded to two longitudinal I-beams 11 and plates 12 are welded to beams 10 to form supports for same. The flywheel 13 serves also as a pulley and a belt, or plurality of belts, connects this pulley with the pulley of the driving motor, which for the sake of simplicity and clarity has not been indicated in the drawings.

A pinion 14 mounted on the flywheel shaft 15 engages gear 16 driving shaft 17 which rotates in bearings 18 and 19 while shaft 15 is journaled in bearings 20 and 21. The shaft 17 is driven by gear 16 through a coupling 22. A bevel gear 23 is rigidly mounted upon shaft 17 on the outside of bearing 19 while both ends of shaft 17 carry cranks 24 which operate the two connecting rods 25.

A bevel gear 26 is in engagement with 23 and is mounted on shaft 27 which is rotatable in bearing 28 mounted on the longitudinal beam 11. The other end of shaft 27 carries a sprocket wheel 29 from which a chain 30 connects with sprocket wheel 31 which drives shaft 32 rotatable in bearings 33 and 34. A cam 35 mounted on the other end of shaft 32 lifts and drops the hammer support 36 which slides in slide 37 which is mounted upon the longitudinal beam 11. The hammer support 36 has a horizontal arm 38 extending at right angles from 36 and forming the support upon which the hammer head 39 is mounted. In cases where explosive powders are handled the hammer head 39 is made from wood or other suitable materials which will not strike sparks.

Referring to Fig. 1, shaft 27 carries a Geneva drive 40 with the pin 41 engaging the slotted disc 42. Disc 42 has eight slots equally spaced around its circumference, one turn of shaft 27 will thus give the disc 42 one-eighth of a turn. Disc 42 is mounted on the end of shaft 43 which turns in bearings 44 and 45 mounted on cross members between the longitudinal beams 11. The other end of shaft 43 carries the turret 46 and the pulley 47 with the conveyor belt 48, see also Figure 3. The turret 46 carries the dies 49 which are arranged in radial lines with 45 degree spacing. The turret shown in Figure 3 has two sets of dies 49 in each position, but three or more dies per position may be used if desired.

The connecting rods 25 link cranks 24 with the two sliding shafts 50 which are slidable through bearings 51 and 52. A crosshead 53 is mounted transversally upon two ends of shafts 50 which are nearest the turret 46. The crosshead 53 has a plurality of holes 54, see Fig. 4, in which are placed the tools consisting generally of punches 55, 56 and 57 mounted concentrically in the ends of the tool holders 58 which is adjustable longitudinally in holes 54 and held in position by set screws 59. The punches 55, 56 and 57 are of proper diameters to fit the dies 49 in turret 46.

Referring now to Figure 3, the powder to be formed is put into hopper 60 where an agitator 61 rotates and keeps the powder from setting. A feeding device consisting of plunger 62 is mounted at the bottom of hopper 60. The plunger 62 is operated by lever 63 which may be given

a reciprocating motion by a cam located on shaft 32. The plunger 62 pushes the powder through opening 64 into the tamping box 65. The tamping box 65 has holes 65a on both ends which line up with punches 57.

The embodiment of the invention shown in the drawings is a tamping machine especially suited to produce the so-called "bobbins" used as cores in the manufacture of electric dry batteries. A bobbin of this type is shown in Fig. 5 where the cylindrical body 66 is made from the depolarizing powder while 67 is the carbon rod forming the positive pole of the battery. The carbon rod 67 is inserted through a hole in the centre of body 66.

Referring now to Figure 3, the hopper 68 is filled with the carbon rods 67. These are fed through a device driven by ratchet 69 with holding pawl 70 and driving pawl 71. The latter is mounted upon a lever 72 rotatably mounted at one end, the other end being driven by rod 73 which receives a reciprocating motion from the crosshead 53. Through the ratchet driven means the carbon rods 67 are fed one at a time down the inclined guide channel 74 into chamber 75.

A guide structure 76 is mounted at the head end of the machine and extends over the turret 46. This guide block contains the guide holes 77 and 78 which serve to guide punches 55 and 56 as well as carbon rods 67.

Referring now to Figures 1 and 6, the ejector mechanism is mounted on the rear of turret 46. It consists of punch rods 79 and 80, one for each of the dies 49 in one position. The punch rods 79 and 80 are slidably mounted in bearings 81 and 82 which again are mounted by bracket 83 upon I-beam 10. A lever 84 with its fulcrum at 85 is fastened at one end to block 86 and its other end is given a reciprocating motion through rod 87 which extends toward the tail end of the machine past the turret 46 to a position where the end will be hit by the crosshead 53. The end of rod 87 carries a bolt 88 and lock nut 89 whereby the length of the stroke may be adjusted.

A structure 90 is mounted across the vertical I-beams 10 at the head of the machine. This structure 90 carries a number of rods 91, 92, 93 and 94 the ends of which are lined up close to the rear of dies 49 and act as bottoms for these, see Fig. 1.

The operation of the machine consists of the following unit operations which are carried out nearly simultaneously during each stroke of the crosshead 53:

1. The turret 46 is moved $\frac{1}{8}$ turn by the Geneva drive, and then held in a rigid position during the remainder of the cycle.

2. The powder to be formed flows down from the hopper 60 and a measured quantity is pushed into the chamber 65 by plunger 62.

3. The hammer head 39 comes down and tamps the powder into a more solid mass.

4. The two punches 57 carried by the crosshead 53 move in through holes 65a and carry a definite amount of powder into the dies 49 where it is compressed into a solid cylindrical body.

5. As the turret next is moved 45 degrees in a counterclockwise direction, as referred to Figure 3, the punches 56 will during the next cycle of the crosshead move in through the guide openings 78 and punch a hole in the compressed powder cylinder.

6. The turret is next moved another step ahead and during the following cycle of the crosshead the punches 55 enter through guide openings 77

and push two carbon rods from chamber 75 until they are securely imbedded in the powder cylinder.

7. After the turret has moved one more step ahead the ejecting rods 79 and 80 push the finished bobbins out on belt 48.

After the machine is in full swing the four last mentioned operations will be carried out simultaneously.

It is to be understood that the form of my invention, herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of my invention, or the scope of the subjoined claims.

Having thus described my invention I claim:

1. In a tamping machine, an intermittently rotatable shaft, a turret on said shaft having molds therein for forming bobbins, means for pushing bobbins out of said molds during that period when the turret is stationary, a pulley mounted on said shaft adjacent said turret, and a conveyor belt engaged over said pulley for receiving said discharged bobbins.

2. In a tamping machine having a turret with dies formed with openings extending completely through the material thereof from the front to the back for receiving the bobbin bodies, a tamping box adjacent the front side of said turret and having an open top and a side opening in its side and openings in its front and back sides which are in line with said openings in said dies, a hopper for the powder to be formed into bobbins located adjacent the latter named side of said tamping box, a plunger in said hopper for forcing a quantity of said powder through said side opening in the tamping box and into the tamping box, punches for extending through said openings in the front and back sides of said tamping box for forcing bobbin bodies cut from the powder in said tamping box into said dies, a hammer extending into the open top of said tamping box, and means for operating said hammer to compress the powder in said tamping box, comprising a hammer support for said hammer and slidably mounted, and a cam for raising and dropping said hammer support.

3. In a tamping machine having a turret with dies formed with openings extending completely through the material thereof from the front to the back for receiving the bobbin bodies, a tamping box adjacent the front side of said turret and having an open top and a side opening in its side and openings in its front and back sides which are in line with said openings in said dies, a hopper for the powder to be formed into bobbins located adjacent the latter named side of said tamping box, a plunger in said hopper for forcing a quantity of said powder through said side opening in the tamping box and into the tamping box, a punch for extending through said openings in the front and back sides of said tamping box for forcing bobbin bodies cut from the powder in said tamping box into said dies, a hammer extending into the open top of said tamping box, and means for operating said hammer to compress the powder in said tamping box, comprising a hammer support for said hammer and slidably mounted, and a cam for raising and dropping said hammer support, said hammer support being slidably mounted in a stationary slide.

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