

No. 895,650.

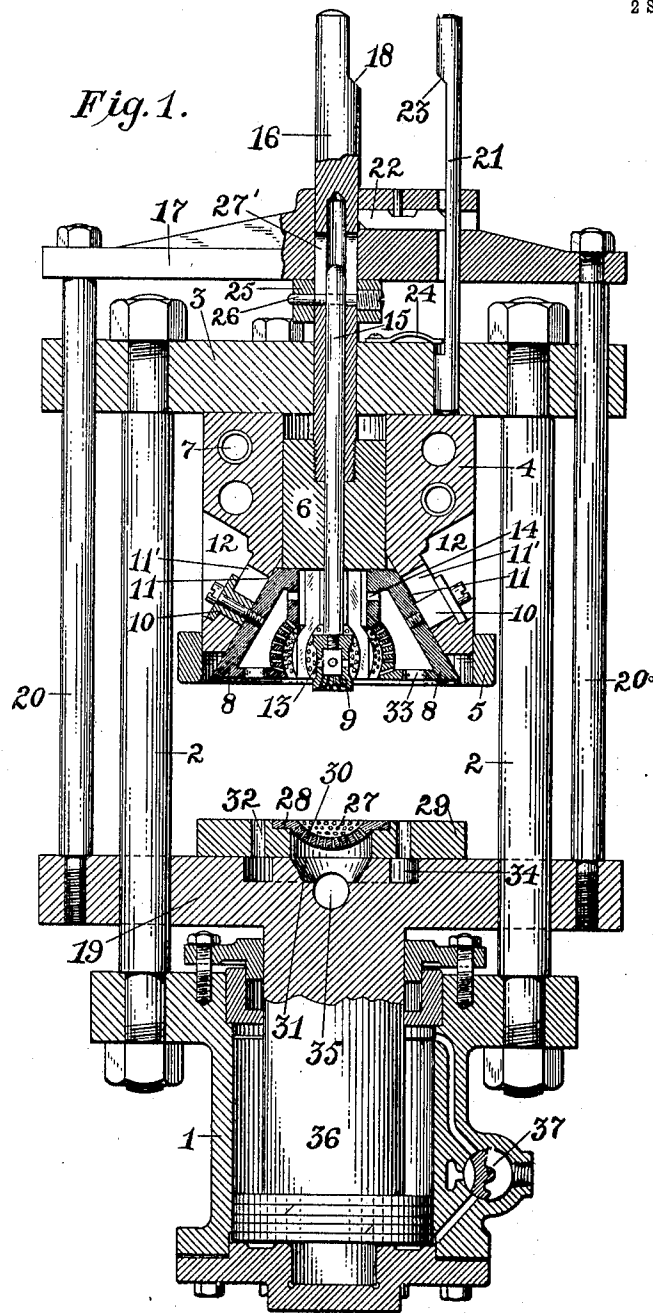
E. G. LOOMIS.

PATENTED AUG. 11, 1908.

MACHINE FOR REMOVING THE GUTTA PERCHA COVERS FROM  
RUBBER CORED GOLF BALLS.

APPLICATION FILED OCT. 8, 1907.

2 SHEETS—SHEET 1.



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Fig. 2.

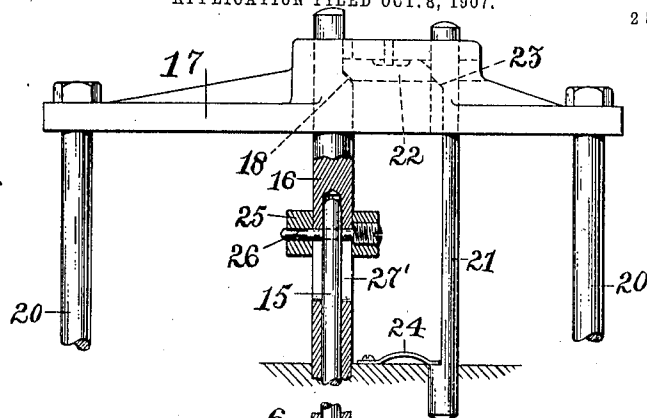


Fig. 3.

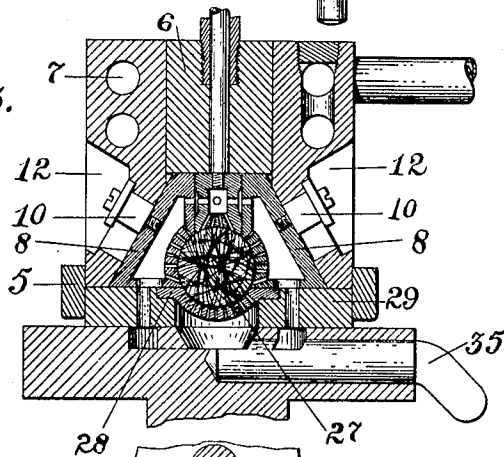
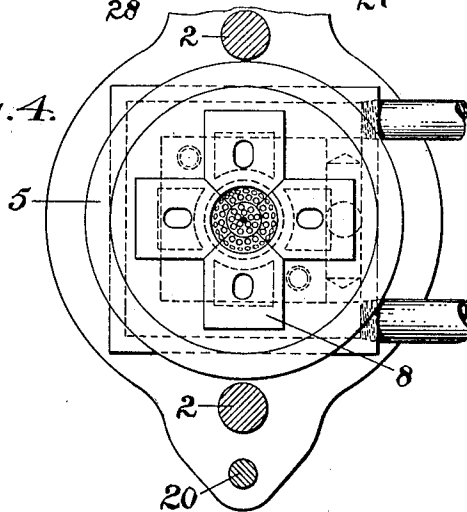


Fig. 4.



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# UNITED STATES PATENT OFFICE.

EVARTS GREENE LOOMIS, OF NORRISTOWN, PENNSYLVANIA.

## MACHINE FOR REMOVING THE GUTTA-PERCHA COVERS FROM RUBBER-CORED GOLF-BALLS.

No. 895,650.

Specification of Letters Patent.

Patented Aug. 11, 1908.

Application filed October 8, 1907. Serial No. 396,466.

*To all whom it may concern:*

Be it known that I, EVARTS GREENE LOOMIS, citizen of the United States, residing at Norristown, Pennsylvania, have invented certain new and useful Improvements in Machines for Removing the Gutta-Percha Covers from Rubber-Cored Golf-Balls, of which the following is a specification.

My invention relates to means for removing the gutta percha covers or exteriors from rubber-cored golf balls, and it consists of a press having a plurality of dies which are perforated and which subject the golf ball to pressure while the parts are heated so that the gutta percha cover will be reduced to a semi-fluid consistency to pass through the perforations in the dies and to be discharged from the machine, leaving the core within the dies to be subsequently discharged after the removing operation of the cover has been performed to the desired extent.

The gutta percha, balata, or other similar substance that is used as a covering or as an exterior layer surrounding the core of golf balls becomes quite soft and of a semi-fluid consistency at a temperature of about 200 F. and will flow readily under pressure, while the vulcanized rubber thread or tape which forms the core is not affected by this temperature and will remain intact, and I have taken advantage of this fact and based my invention thereupon.

In the accompanying drawings, Figure 1 is a vertical sectional view through the center of the complete machine with the dies open ready to receive a golf ball. Fig. 2 is a detail view of the mechanism which effects the opening of the dies and ejecting of the core, the parts being in the position assumed at the end of the up stroke of the machine. Fig. 3 is a central vertical sectional view through the dies in closed position, said section being taken at right angles to Fig. 1, this view showing in section also the die head, the platen, and a golf ball core in position at the end of the up stroke. Fig. 4 is a bottom plan view of the die-head of Fig. 3 with platen, lower die plate and die, and the core removed, illustrating the form of the upper dies and the manner in which they fit together.

Referring to Fig. 1 the stationary frame of this machine consists of the cylinder 1, the

posts 2 which are fastened thereto and carry fixed at their upper ends the head-plate 3. To the under side of the head-plate is secured the die-head 4, which is rectangular in cross section except for a short portion of its lower end which is turned circular so that the ring 5 may be fitted to it, the formation of these parts being illustrated in Fig. 4. Through the center of the die-head is a round hole in which plunger 6 has a sliding fit. Steam passages are provided in the die-head for the purpose of heating the dies 8 and 9. At the lower end of the die-head there are four guide slots 11 formed therein, 90° apart and inclining upwardly and inwardly, in which fit the wedge shaped dies 8 Fig. 4, having are shaped inner faces. The dies 8 are four in number but I do not limit myself to this number. Their back or outside faces are on an angle to correspond with the angle of the inclined guide-ways in the die-head in which they fit to slide therein. Their side faces are parallel and at right angles to the back face. Their meeting faces where they fit together are in radial planes passing through the center line of the machine (see Fig. 4). Their bottom faces, when they are elevated to their upper limit are flush with the bottom surface of the die-head 4 (Fig. 3). When they are in this elevated position, as shown in Figs. 3 and 4, they provide within them a die cavity or space of truncated spherical form with a diameter approximately that of the golf ball core, this space being greater than half a sphere, and at the upper ends of the dies there is a cylindrical space in which fits the die 9. These dies 8 are hollow and their inner walls are perforated with small holes which place the die cavity in connection with the hollow parts or chambers of the dies. The dies are held in place and allowed to slide up and down along their inclined guide-ways by means of the screws and shoulder studs 10, which fit and slide in guide ways or slots 11' in the sides of the die-head 4. These slots extend through to the pockets 12 cast in each vertical face of the die-head as shown. The ejector die 9 is cylindrical in form and is provided with a concave spherical bottom face which conforms in curvature to the spherical surfaces of dies 8 when in elevated position and completes the upper part of the spherical die cavity. This die 9 is also

formed hollow and is provided with small holes leading into its hollow interior. It also has several larger holes 13 leading out through its cylindrical walls which come opposite holes 14 when the dies 8 are in their elevated position.

The die 9 is fastened to the end of the ejector-rod 15, which latter passes up through plunger 6 and into the tubular portion of plunger-stem 16. Die-opener-plunger 6 is a cylindrical piece which bears on the upper ends of dies 8. Plunger-stem 16 is screw threaded into the upper end of plunger 6, passes through the stationary head-plate 3 and through the cross-arm 17. At its upper end it is flattened on one side leaving a bevel shoulder at 18, as shown. Cross-arm 17 is connected rigidly with platen 19, by posts 20 and partakes of the full movement thereof. A lock controlling rod 21 is guided through the head plate 3 and the cross-head or arm 17, said rod controlling a locking device or pawl 22 arranged to slide in an opening in the cross-arm 17 to engage and disengage the plunger stem 16 before described.

Pawl controlling rod 21 is flat for part of its length, leaving a bevel shoulder 23 near its upper end which engages the sliding pawl or lock 22 and it has also a square shoulder near its lower end which is engaged by the spring 24 fixed on the head plate. The lock or pawl 22 has its two ends beveled on opposite sides as shown. A collar 25 is slidably fitted on the plunger-stem 16 and is connected to the ejector rod 15 by a pin 26 which passes through longitudinal slots 27' on either side of the tubular stem and through a hole in the rod.

The lower die 27 is cup shaped and its upper surface, when elevated in position of Fig. 3 completes the spherical form of the die cavity. It has a rim 28 which fits into, and by which it is fastened to a die holder 29. Holes 30 are drilled through its wall and communicate with the open space 31 under it, which is a circular opening through the center of the die holder 29. The die holder is circular in form and is turned on its outside circumference to a close sliding fit with ring 5. It has four holes through it at 32 which come opposite to the elongated holes 33 through the bottom of dies 8, shown in Figs. 3 and 4, and which holes 32 lead into a circular trough 34 in platen 19, which in turn communicates with the large hole 35 in platen 19, which serves as the gutta percha outlet. The space 31 under lower die 28 also connects with the outlet hole 35 as shown.

The power which operates the machine in this case is steam, but obviously hydraulic or pneumatic power can be used instead to move the piston 36 up and down, and I do not limit myself in this respect, as any means whatsoever, adapted for the purpose, may be used. Steam is here preferred as it serves

a double purpose in that, as there is sufficient heat conducted from the cylinder and piston rod to heat the lower die and platen to soften the gutta percha, no special piping or connections are required for this purpose.

The operation is as follows: When the machine stands in the open position of Fig. 1 and the dies are sufficiently heated by the circulation of steam through the die-head, a golf ball is laid on the lower die 27 and the cylinder valve 37 operated to admit steam under the piston which forces up the platen 19. The golf ball first touches die 9 and presses it up till said die shoulders against plunger 6. Then die-holder 29 comes in contact with the bottoms of dies 8 and forces them upward. The latter sliding on their inclined guides are forced together upon the golf ball, and the gutta percha softened by the heat of the dies is expressed through the small holes in the walls of the dies. Ring 5 being a close fit about die-holder 29 prevents the escape of any of the material between the die head and the die holder, and therefore all the gutta percha is constrained to flow to the outlet hole 35 and thence out of the machine. The parts are now in the position shown in Figs. 2 and 3 in which the plunger stem 16 has become locked to the cross-head or arm 17, as will now be described. During the upward stroke the cross-arm 17 carries the latch or slidable pawl 22 with it and this pawl coming into engagement with the shoulder 23 on rod 21 raises the latter until the opposite end of pawl rises above the horizontal plane of the shoulder 18 on stem 16, when spring 24 pressing down on rod 21 forces the pawl into engagement with shoulder 18 on plunger stem 16 and locks it in that position as shown in Fig. 2, with the end of the pawl bearing against the plain side of the controlling rod 21. Steam is now admitted above and exhausted below the piston 36, bringing down the platen 19. Cross-arm 17 forces down plunger-stem 16 by means of the lock 22 and also the plunger 6, which in turn forces dies 8 down and apart. This motion continues till the latter have separated sufficiently for the golf ball core to clear their lower lips. Then rod 21 having had its downward motion arrested by coming in contact with the top of die-head 4, and pawl 22 becoming free to slide to the right disengages the plunger-stem 16 from the cross-arm 17. The platen and lower die now continue to move downward without further motion of the upper dies until the cross-arm strikes collar 25 and forces down the ejector die 9. This delivers the core free from the dies and allows it to be taken from the machine. Towards the end of the downward stroke pin 26 reaches the bottom of the slots 27' in the plunger-stem and the dies 8 are further opened apart until they will admit of a full sized golf ball pass-

ing up between them. The machine now stands again in the open position of Fig. 1 and is ready for the operation to be repeated.

It will be seen from the above that I have provided means whereby the golf ball is heated and thereby softened to such an extent that the material of which its outer portion or cover is composed is reduced to a semi-fluid consistency, rendering it possible to cause this to be expressed through the perforated walls of the die and thus separated from the core, which may then be discharged from the machine.

My invention involves the employment of heat and pressure to soften the covering of the core of the golf ball and to then express the same through the openings in the dies so as to pass to the point of discharge away from the machine.

It will be observed that all of the movements of the die operating plunger and the ejector rod are derived from the up and down movements of the platen 19 and cross-head or arm 17, and further that the member 9 acts both as a die member and as an ejector.

Where herein I have referred to an upwardly movable lower die it will be understood that I do this for convenience of description and I do not limit myself thereto, it being essential only that the dies be given a relative movement and therefore the upper series of dies may move down to close with the lower die.

I claim as my invention:—

1. In combination, in a machine for removing covers from golf balls, a plurality of die members for pressing upon the golf ball, said members being perforated, and means for heating the die members whereby the covering is softened and expressed through the said perforation, substantially as described.

2. In combination, in a machine for removing the covers of golf balls, a series of die members which when in closed position provide a spherical cavity of substantially the diameter of a golf ball core, means for heating the dies and means for operating them to press upon the golf ball, said dies being perforated for the escape of the softened material of the cover, substantially as described.

3. In combination, in a machine for removing the covers of golf balls, a plurality of die members for pressing upon the golf ball, said members being perforated for the passage of the softened material and means for heating and operating the die members to express the material of the cover through said openings, one of said dies serving as an ejector for the core, substantially as described.

4. In combination, in a machine for removing the covers of golf balls, a group of die members movable in respect to each other to form a truncated spherical cavity when in closed position and a single die mem-

ber, said group of members and said single die member having relative movement and when together forming a spherical die cavity substantially of the size of the golf ball core and means for giving the members their relative movement, substantially as described.

5. In combination, in a machine for removing golf ball covers, a group of die members having movement in respect to each other, and another die member, said group of dies and said other die having relative closing movement and the said group of die members being operated by the contact of said other die in moving to closed position and means for heating the dies, said dies having means of escape for the expressed covering material, substantially as described.

6. In combination, in a machine for removing golf ball covers, a group of die members radially movable, inclined guides for the said die members, and a single die member, and means for bringing the said group of die members and the single die member together, the group of die members being moved into closed position by the contact of the single die member therewith, substantially as described.

7. In combination, in a machine for removing the covers of golf balls, a group of hollow dies, having perforations in their walls leading from the die cavity, a single perforated die member to cooperate with the group of dies to complete the die cavity, a holder for said single die, a space beneath the single die for the escape of the soft covering material, a passage leading from said space, and passages leading from the hollow die members and connecting with passages through the die holder when the die members are closed for the discharge of the softened covering material, substantially as described.

8. In combination, in a machine for removing the covers from golf balls, a plurality of perforated die members, means for closing the die members, and means for heating the die members and for operating the same including the steam passages and the steam cylinder and piston, substantially as described.

9. In combination, in a machine for removing the covers from golf balls, a plurality of dies having movement towards and from each other, one of said dies deriving its movement from the pressure of the ball, a die member movable towards and from the series of dies and arranged to operate the same by contact therewith, said die member being adapted to receive the ball, all of said die members being perforated and means for applying heat, substantially as described.

10. In combination, in a machine for removing the covers of golf balls, a group of radially movable dies, a die vertically movable and arranged to close the upper part of the die cavity, said vertically movable die

being normally in its lowest position and a single die member movable towards and from the group of dies and the vertically movable die, said dies being perforated and means for heating the dies, substantially as described.

11. In combination, a plurality of radially movable dies, inclined guides for the said dies converging upwardly and which cause the closing of the die members when they are moved upwardly, a die plunger for operating the dies, a vertically movable die adapted to close the upper portion of the die cavity and a lower die movable towards and from the group of dies, said dies being perforated for the escape of the solvent material and means for heating the dies, substantially as described.

12. In combination with a plurality of radially movable dies, a vertically movable die member to close the upper portion of the die cavity, inclined guides for the radially movable guides which guides effect the closing and opening of the die members when moving, a die plunger and means for operating the same, the said die plunger forming a stop for the upward movement of the vertically movable die and also having the upper ends of the radially movable die members in contact therewith, substantially as described.

13. In combination in a machine for removing the covering from golf balls, a plurality of radially movable dies, a vertically movable die arranged to close the upper part of the die cavity, a lower die, means for opening and closing the dies, and means for moving the vertically movable die downwardly when the dies are open to discharge the core, the said dies being perforated, and means for applying heat, substantially as described.

14. In combination, a plurality of radially movable dies, inclined guides therefor, a lower die arranged to contact with the radially movable dies to move them along their inclined guides and cause them to close, a ring within which the lower die moves to prevent the escape of fluid at this point, said dies being perforated and means for heating the dies, substantially as described.

15. In combination in a machine for removing the covering of golf balls, a plurality of radially movable dies, a die member movable vertically in respect to the radially movable dies, a lower die member and means for operating the die members whereby the radially movable dies will be given successive

opening movements and the vertically movable die will be moved downwardly to eject the core of the golf ball, said dies being perforated for the escape of the material of the covering and means for heating the dies, substantially as described.

16. In combination in a machine for removing the covers of golf balls, a group of radially movable upper dies, a vertically movable die to close the upper part of the die cavity, a lower die member, a platen carrying the same, a cylinder and piston for operating the platen, an upper cross-head, connections between the said cross-head and the platen and connections between the cross-head and the group of radially movable dies and also between said cross-head and the vertically movable die to give the same their opening movements, and the upper die its vertical movement, substantially as described.

17. In combination, a group of radially movable upper dies, a vertically movable die to close the upper part of the die cavity, a lower die member, said radially movable dies and the vertically movable die being operated into closed position by the pressure upon the ball and from the lower die, means for operating the lower die, a cross-head and connections between the same and the upper dies for giving the said radially movable dies and the vertically movable die their opening movements, substantially as described.

18. In combination in a machine for removing the covers from golf balls, a plurality of radially movable dies, a vertically movable die to close the upper part of the die cavity, a lower die, means for operating the lower die towards and from the upper dies, a cross-head operating in unison with the lower die, a plunger stem in connection with the radially movable dies, an ejector rod movable axially of the plunger stem and connected with the vertically movable die, a latch between the cross-head and the plunger stem, a member on the ejector rod to contact with and be operated by the cross-head and a controlling rod for the latch whereby the plunger stem is connected with and disconnected from the cross-head at the predetermined times, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses.

EVARTS GREENE LOOMIS.

Witnesses:

E. R. ROBERTS,  
AVONIA FRICK.