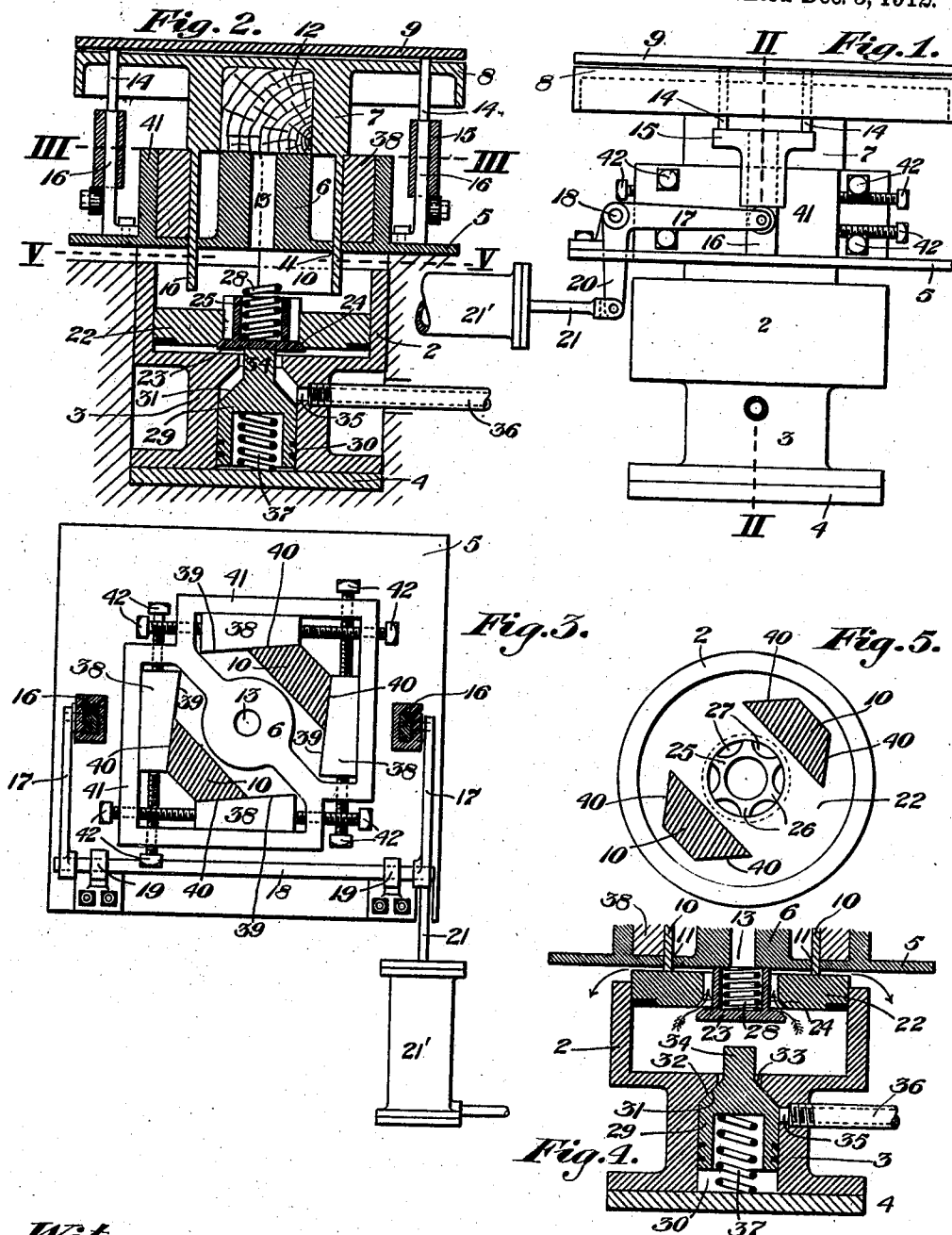


H. L. DEMMLER.
BUMPING MACHINE.
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Patented Dec. 3, 1912.



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UNITED STATES PATENT OFFICE.

HENRY L. DEMMLER, OF KEWANEE, ILLINOIS.

BUMPING-MACHINE.

1,045,956.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRY L. DEMMLER, a citizen of the United States, residing in Kewanee, in the county of Henry and State of Illinois, have invented a new and useful Improvement in Bumping-Machines, of which the following is a specification.

My invention refers to improvements in molding apparatus, and has for its object to provide automatic mechanism for vibrating the flask to pack the sand around the pattern in the manner and by the means hereinafter more fully described.

Referring to the drawings: Figure 1 is a view of the apparatus in side elevation. Fig. 2 is a vertical sectional view on the line II. II. of Fig. 1. Fig. 3 is a horizontal sectional view on the line III. III. of Fig. 2. Fig. 4 is a partial sectional view similar to Fig. 2 showing the piston raised and in lifting contact with the platen legs, illustrating the exhaust. Fig. 5 is a horizontal sectional view on the line V. V. of Fig. 2.

Generally stated the apparatus comprises a cylinder provided with a piston and an automatically controlled inlet valve and outlet valve, super-imposed base plate or frame, a vertical reciprocating platen mounted therein, an upper stripping plate and means for independently supporting the plate in position to be operated upon underneath by the reciprocating platen due to the vertical lifting movement of the piston.

In the drawings 2 represents the cylinder in the lower portion of which is provided a valve casing 3, said cylinder and valve casing being preferably integral and mounted upon any suitable supporting base 4.

5 is a base plate rigidly mounted slightly above the top of the cylinder 2 on any suitable supporting structure as indicated so as to form a permanent stationary portion of the apparatus, said base plate being provided with a centrally arranged supporting abutment or bridge 6 adapted to normally support the platen 7 at its middle portion underneath. Said platen 7 is provided at its upper portion with a flat table extension 8 or is otherwise suitably designed for the purpose of supporting and carrying the stripping plate 9, and is also provided with downwardly extending legs 10, 10, of any suitable construction, which legs project

downwardly from the central body portion 7 through guiding apertures 11 in the base plate 5.

12 is a block of wood or other suitable cushioning material designed to absorb the shock of impact, set within a suitable receiving cavity in the middle portion of the platen 7 and adapted to normally rest upon the bridge or abutment 6 of base plate 5, said abutment being preferably hollow through its middle portion as indicated at 13.

The stripping plate 9 is designed to be lifted above the upper surface of the platen table 8, and to be held independent thereof, by means of lifting pins or studs 14 extending upwardly from vertically sliding yokes 15, 15, mounted in vertical guiding posts 16, 16, or other suitable means, projecting upwardly from base plate 5 and preferably at each opposite side thereof. For the purpose of lifting the flask plate 9 by said means I provide levers 17, 17, mounted upon rock shaft 18 in suitable bearings 19, 19 of base plate 5, one of said levers 17 or shaft 18 as preferred having a lever extension 20 connected to a piston rod 21, the piston of which is mounted in a fluid actuated cylinder 21'. By such construction it will be seen that fluid pressure being exerted against the back of the said piston in cylinder 21', levers 17 will be raised lifting yoke 15 and pins 14, thus raising the plate 9 to the desired position, which may be slightly above the upper surface of the platen table 8 at its lowermost position, as shown in Fig. 2.

22 is the vertically reciprocating piston mounted in cylinder 2 by which impact is imparted to the platen 7 and thence to plate 9 and flask thereon upon piston 22 coming into abutting contact with the lower terminals of the platen legs 10. Said piston is provided with a suitable packing ring or other packing around its exterior periphery as shown, for the purpose of making a fluid-tight joint within the cylinder.

In the piston 22 is an exhaust valve 23 seating upwardly against the under side of the piston which is provided with a corresponding valve seat 24, and an inner opening, through which opening projects the upper middle body portion 25 of the exhaust

valve 23. Said upwardly projecting portion 25 of the exhaust valve is preferably provided with a series of annularly arranged guiding ribs 26 bearing within against the walls of the piston aperture, and between said ribs 26 are a corresponding series of vertically arranged annular recesses 27 for the purpose of permitting exhaust of the lifting fluid from beneath the piston upon the exhaust valve being unseated when coming into contact with the underside of the base plate 6. For the purpose of cushioning the exhaust valve it is preferably provided with a cushion spring 28 set within the exhaust valve in a suitable receiving cavity, as clearly shown.

29 is the automatically controlled inlet valve mounted within a suitable chamber 30 of valve casing 3, provided at its upper portion with a tapered seat 31, adapted to make closing contact with a corresponding seat 32 at the upper portion of the valve chamber, and an inlet opening 33 leading from said chamber upwardly into the interior of cylinder 2 through which projects an upper reduced terminal stem 34 of valve 29.

35 is an inlet port leading from any suitable source of pressure supply as by pipe 36, which may be controlled by any convenient valve mechanism to supply the energizing pressure. Port 35 is so located that it will be uncovered by piston 29 when in its lowermost position as shown in Fig. 2, but will be covered, shutting off the supply when the said valve 29 is raised as shown in Fig. 4.

For the purpose of lifting valve 29 I provide a spring 37 which may be conveniently made in the form of a coiled spring set within a central cavity in valve 29 bearing downwardly against base plate 4, tending to normally raise the valve 29 to cut off the supply.

In its normal position piston 22 and exhaust valve 23 will rest downwardly at the lower portion of cylinder 3, piston 22 pressing exhaust valve 23 down upon stem 34 uncovering port 35 for admission of fluid such as compressed air or steam. Such pressure being admitted, piston 22 will rise making abutting contact against legs 10, lifting platen 7 against plate 9 until spring 28 or upper end of extension 25 of the exhaust valve 23 comes into contact with the underside of the base 6, whereupon the exhaust valve 23 will be arrested as shown in Fig. 4. Continued upward travel of piston 22 will open the exhaust ports comprising the channels 27, allowing the fluid underneath the piston to escape to the atmosphere. In the meantime spring 37 having projected valve 29 upwardly, cuts off the supply of fluid through port 35, said port not being again uncovered until piston 22 and exhaust valve

23, falling by gravity against stem 34, will depress valve 29 against its spring, resulting in again opening port 35, whereupon the operation which I have just described will be repeated. Said operation will continue intermittently as long as fluid pressure is supplied through pipe 36 resulting in a series of quick intermittent reciprocations of the platen 7, base plate 9, and the flask supported by the base plate. It will be understood that said plate is preferably secured to the plate 9 by any suitable means as will be readily understood.

For the purpose of providing sliding bearings for the downwardly extending legs 10 of platen 7, any suitable guiding means may be provided as by mere elongated bearings in the base plate 5 embracing said legs, but for the purpose of taking up wear and accurately adjusting the bearings to insure the best results, I have provided adjustable wedge-shaped blocks 38 adapted to be set inwardly by their inner tapered faces 39 against corresponding faces 40 of legs 10, as clearly shown in Fig. 3. Said blocks 38 are capable of accurate adjustment within embracing housings 41, extending upwardly from the base plate 5, by adjustable temper screws 42 mounted in said housings and bearing preferably against both ends of the wedge blocks 38. By such means the vertical travel of the platen is accurately adjusted and all wear compensated for.

The operation of the invention will be readily understood from the foregoing description.

The apparatus is extremely simple in construction, provides for all of the contingencies arising in the use of mechanism of this class. It may be used to give rapid or slow vibration to the molding flask depending upon the pressure or supply of the energizing fluid, and is entirely automatic in its operation as has been fully described.

The invention may be changed or varied by the skilled mechanic in different details, design or other features, and I do not desire to be confined to the exact construction shown and described.

What I claim is:

1. The combination of a cylinder having an inlet valve, a vertically reciprocating piston provided with an exhaust valve adapted to be opened by contact with an abutment, a superimposed base plate, a vertically reciprocating platen adapted to be engaged by said piston, and guiding means for the platen, substantially as set forth.

2. The combination of a cylinder having an inlet valve, a vertically reciprocating piston provided with an exhaust valve adapted to be opened by contact with an abutment, a superimposed base plate having a vertically reciprocating platen adapted to be engaged by said piston, an upper strip

ping plate, and means for supporting the stripping plate independent of the platen, substantially as set forth.

3. The combination of a cylinder having an inlet valve, a vertically reciprocating piston provided with an exhaust valve adapted to be opened by contact with an abutment, a superimposed base plate having a vertically reciprocating platen adapted to be engaged by said piston, an upper stripping plate, and vertically adjustable means for supporting the flask plate independent of the platen, substantially as set forth.

4. The combination of a cylinder having an inlet valve, a vertically reciprocating piston provided with an exhaust valve adapted to be opened by contact with an abutment, a superimposed base plate having a vertically reciprocating platen provided with downwardly extending projections adapted to be engaged by said piston, an upper flask-supporting element, and means for supporting said element independent of the platen, substantially as set forth.

5. The combination of a cylinder having an inlet port, a vertically reciprocating spring controlled valve for said port, a reciprocating piston provided with an exhaust valve adapted to be opened by contact with an abutment, and also arranged to actuate said spring-controlled valve, an upper base plate, a vertically reciprocating platen having a downwardly extending portion adapted to be engaged by said piston, an upper flask-supporting plate, and means for supporting said plate independent of the platen, substantially as set forth.

6. The combination of a cylinder having an inlet port, a vertically reciprocating spring-controlled valve for said port, a reciprocating piston provided with an exhaust valve adapted to be opened by contact with an abutment and also arranged to actuate said spring-controlled valve, an upper base plate, a vertically reciprocating platen having a downwardly extending portion adapted to be engaged by said piston, an upper flask-supporting plate, and vertically adjustable means for supporting the flask plate independent of the platen, substantially as set forth.

7. The combination of a base plate having a central supporting abutment, a vertically reciprocating platen having legs projecting downwardly through the base plate at each side of said abutment, and means for imparting vertical motion to said legs and to the platen, substantially as set forth.

8. The combination of a base plate having a central supporting abutment, a vertically reciprocating platen having a middle cavity and a buffer block therein and legs projecting downwardly through the base plate at each side of said abutment, and means for imparting vertical reciprocating motion to

said legs and to the platen, substantially as set forth.

9. The combination of a base plate having a supporting abutment, a platen having legs extending downwardly through the base plate at each side of said abutment, an upper plate, means for vertically adjusting said plate independent of the platen, and means for imparting vertical reciprocating motion to said legs and to the platen, substantially as set forth.

10. The combination of a base plate having a middle abutment and a guiding opening at one side thereof, a platen having a downwardly extending leg projecting through said opening, and a vertically reciprocating piston adapted to engage said leg to actuate the platen, substantially as set forth.

11. The combination of a base plate having a middle abutment, guiding openings at each side of said abutment, a platen having legs extending downwardly through said opening, bearing gibs for said legs and adjusting means therefor, and a vertically reciprocating piston adapted to abut against said legs to reciprocate the platen, substantially as set forth.

12. The combination of a base plate provided with a vertically arranged guiding aperture and flanking vertically arranged slide bearings, a reciprocating platen having a downwardly projecting portion passing through said aperture and in sliding engagement with said bearings, and a reciprocating piston arranged to make abutting contact with said projecting portion, substantially as set forth.

13. The combination of a base plate provided with a vertically arranged guiding aperture and flanking vertically arranged slide bearings, a reciprocating platen having a downwardly projecting portion passing through said aperture and in sliding engagement with said bearings and a reciprocating piston arranged to make abutting contact with said projecting portion, and provided with a relatively movable relief valve, substantially as set forth.

14. The combination of a base plate having a central abutment, a vertical reciprocating platen having an element projecting downwardly laterally of said abutment, and automatic fluid-actuated means for imparting vertical reciprocating motion to the platen, substantially as set forth.

15. The combination of a base plate having a central supporting abutment, a vertically reciprocating platen having legs projecting downwardly laterally of said abutment, and automatic-fluid actuated means for imparting vertical reciprocating motion to said legs and to the platen, substantially as set forth.

16. The combination of a base plate hav-

ing a central supporting abutment, a vertically reciprocating platen having a middle cavity and a buffer block therein and legs projecting downwardly at each side of said
5 abutment, and automatic fluid-actuated means for imparting vertical reciprocating motion to the said legs and to the platen, substantially as set forth.

10 17. In a bumping machine, the combination with a base plate provided with a vertically arranged guiding aperture and slide bearings, of a co-acting vertically reciprocating platen, a cylinder and a piston contained therein having a valve for exhaust-
15 ing fluid pressure from the cylinder, a valve casing having a supply port and a normally open port leading from the interior of the valve casing to the cylinder, and a valve in

said case adapted to be located in open position by the piston valve and having a spring 20 for closing it when the pressure of the piston is removed.

18. The combination of a base plate, a reciprocating platen having a downwardly projecting portion, an unattached reciprocating piston arranged to engage said portion and provided with a centrally arranged valve, and a valve controlling fluid pressure to the piston. 25

In testimony whereof I have signed my name to this specification in the presence of the subscribing witnesses. 30

HENRY L. DEMMLER.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."