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A. F. BAKER

TYMPAN CLAMP

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Fig. 1.

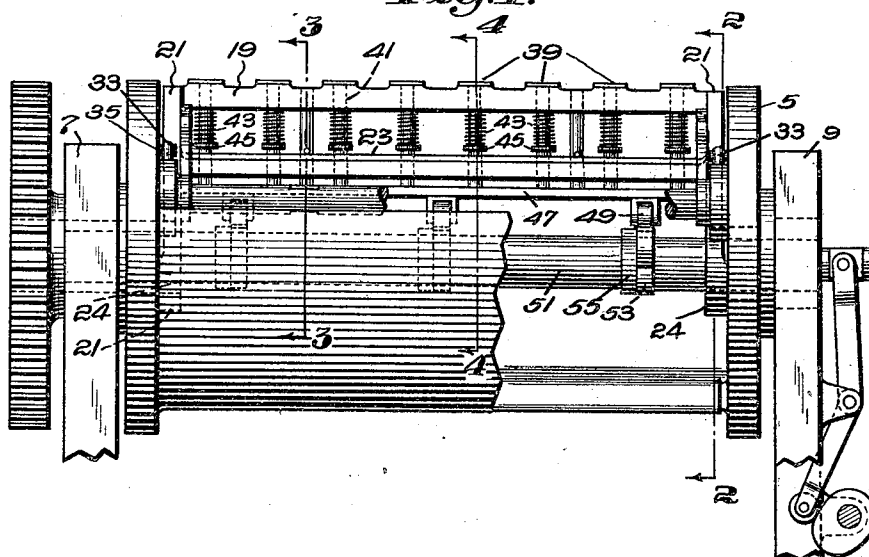


Fig. 2.

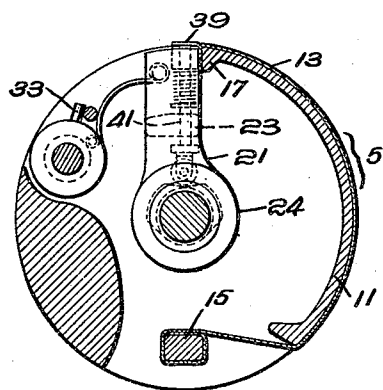


Fig. 3.

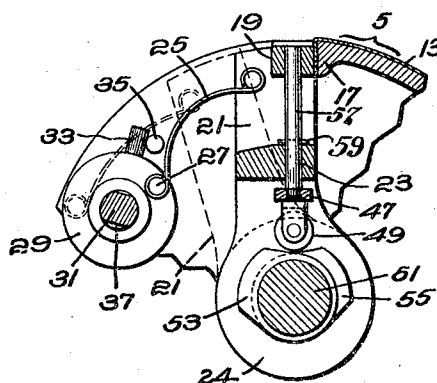
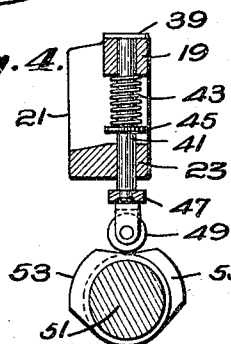


Fig. 4.



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UNITED STATES PATENT OFFICE.

ALEXANDER F. BAKER, OF QUINCY, MASSACHUSETTS.

TYMPAN CLAMP.

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To all whom it may concern:

Be it known that I, ALEXANDER F. BAKER, a citizen of the United States, and a resident of Quincy, county of Norfolk, and State of Massachusetts, have invented an Improvement in Tympan Clamps, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to printing machinery and the object is to provide an improved mechanism for clamping the tympan to a cylinder and in its more specific aspect it contemplates the provision in a single structure of a combined tympan clamp and sheet gripper.

My invention will be readily understood by reference to the following description of an illustrative embodiment thereof shown by way of example in the accompanying drawings, wherein:

Fig. 1 is an elevation of a cylinder with one form of my improved mechanism applied thereto and with parts broken away; and

Figs. 2, 3 and 4 are sections on like numbered lines of Fig. 1, Figs. 3 and 4 being on an enlarged scale.

Referring to the drawings, I have there shown in Fig. 1 for the purpose of illustrating my invention an impression cylinder 5 trunnioned in the frame members 7 and 9. Referring to Fig. 2, the portion 11 of the cylinder is adapted to support the tympan or blanket 13, one end of which, as shown on the upper side in Fig. 2, may be clamped by the improved form of clamp presently to be described and the other end of which is secured by any known or suitable form of take-up mechanism 15.

Herein the end of the tympan 13 is clamped against the edge 17 of the supporting surface 11 by means of a clamping bar 19 which may be movably supported on two swingable radial arms 21 preferably centered at the center line of the cylinder 5 and conveniently located adjacent the bases of that cylinder, the cross-bar 19 and the arms 21 forming a U, the legs of which may be braced by the cross web 23. Herein (see Fig. 2) I have shown the arms as pivoted on hub-like studs 24 at the bases of the cylinder.

To swing the arms 21 so that the bar 19 is pressed in gripping relation against the

abutment 17 I may utilize blade springs 25 secured to these arms and normally tensioned to press the arms to the right viewing Fig. 3 as there illustrated in full lines. When it is desired to release the tympan the arms may be swung to the left to release the clamping pressure and for that purpose I preferably adopt such a construction as is herein shown and which I will next describe. The springs 25 may be secured to pins 27 eccentrically mounted on crank discs 29 disposed adjacent the bases of the cylinder 5 and carried by a rock shaft 31 extending lengthwise of the cylinder in the interior of the same. Pins 33 on the crank discs are adapted to make contact with stop pins 35 on the bases of the cylinder 5. When the gripper is closed the pin 27 is normally somewhat below the line connecting the center of the shaft 31 and the point of connection with arm 21 of the spring 25, the spring 25 and the disc being in effect arms of a toggle which is slightly broken past dead center position so that the tension of the spring, without materially relaxing the clamping pressure thereof on the tympan clamping bar 19 tends still further to break the toggle and to rotate the disc 29 clockwise viewing the figure, thus holding the pins 33 and 35 in engagement as shown. To relax the clamping pressure the shaft 31 may be rotated, counterclockwise in the figure, and I have herein shown (see Fig. 3) flattened surfaces 37 thereon to facilitate the application of a wrench or the like. As the shaft 31 is turned the spring 25 is somewhat compressed until the point 27 moves past dead center and then the toggle is free to break in the reverse direction, the disc 29 will rotate freely in a counterclockwise direction and the arms 21 may swing to the dotted line position of Fig. 3, thus releasing the tympan from between the parts 19 and 17.

In the embodiment of my invention here illustrated the tympan clamp also carries grippers for seizing a sheet of paper and they herein take the form of gripper fingers 39 adapted to cooperate with the circumferential surface of the bar 19. To open and close these grippers at proper times they are mounted (see Fig. 4) on reciprocating rods 41 guided in the bar 19 and the cross web 23 and they are normally pressed to closed position by springs 43 surrounding the rods and interposed between the bar 19 and suitable collars 45 carried by the rods.

The lower ends of the rods 41 may be connected to a cross member 47 on which is mounted one or more cam follower rolls 49 adapted to cooperate with cams on a cam shaft 51 concentric with the impression cylinder 5. In the present embodiment of the invention the cam shaft 51 does not rotate and the rods are operated by the rotation of the cylinder 5 carrying the follower rolls 49 around the cams. To permit the grippers to be operated at different times in the revolution of the cylinder 5 I may provide for each follower a pair of edge cams 53 and 55 having noses or rise portions relatively displaced circumferentially and adapted alternatively to be brought into cooperation with the followers. To effect this the cams 53 and 55 may be placed side by side on the shaft which may be shifted axially to bring one or another into cooperation with a follower 49. In the drawings I have shown cams 53 as in operative position and it will be clearly understood from Fig. 4 that in the rotation of the cylinder the cam will operate at intervals to lift the rods 41 simultaneously against the force of the springs 45, raising the gripper fingers 39 and opening the grippers for the reception or release of a sheet of paper. If the shaft 51 is shifted to the right viewing Fig. 1 the cams 53 will be thrown out of action and the cams 55 will be brought into line with the followers 49 so that they will act to lift the rods during the succeeding rotation of the cylinder and the opening of the grippers will take place at a different time due to the relative circumferential displacement of the rises on cams 53 and 55 as shown in Fig. 3. To obviate drag and to facilitate the shifting of the shaft 51 the cam followers 49 conveniently are supported free of the lower portions of the cams and make contact only with the rises of the same at the time when the grippers are to be opened and for this purpose and to avoid undue strain on the gripper fingers 39 the cross-bar 47 which carries the followers may have connected thereto rods 57 guided in the cross web 23 and clamping bar 19 and adapted to receive stop pins 59 which make contact with the upper surface of the former and stop the downward movement of the gripper carrying rods 41 and their associated mechanism under the action of the springs 45. The shaft 51 may be actuated in any desired manner and I have herein shown it extending to the exterior of the cylinder (see Fig. 1) and having a squared portion cooperating with a yoke 61 on a pivoted lever 63, which lever may be swung at suitable intervals by cam 65 which is driven in any desired manner at proper times in the operation of the printing mechanism as a whole. The cooperation of the yoke 63 with

the squared portion of the shaft holds the latter against rotation and the shifting movement, taking place while the followers 49 are supported away from the cams as shown in Fig. 3, is readily effected.

It will be apparent that as the arms 21 swing about the center of the cylinder and the axis of revolution of the cam shaft 53 the tympan clamp can be moved freely from the full to the dotted line position of Fig. 3 when it is desired to release the tympan without disarranging the gripper operating mechanism.

I have described in detail the particular embodiment of my invention shown by way of example in the accompanying drawings. Obviously the construction may be varied widely without departing from the invention and what I claim as new and desire to secure by Letters Patent I shall express in the following claims.

Claims:

1. A cylinder having a tympan clamp organized to swing about the center of the cylinder, grippers carried by the clamp and a shaft disposed centrally of the cylinder for operating the grippers.
2. A cylinder having a movable clamp for securing the tympan and grippers carried by said clamp and movable therewith.
3. In combination with a cylinder radial arms, a bar carried thereby and serving as a tympan clamp, plungers in said bar having gripper fingers thereon and means disposed at the pivot of said arms for operating the plungers.
4. In combination with a cylinder radial arms, a bar carried thereby and serving as a tympan clamp, plungers in said bar having gripper fingers thereon and a central cam shaft for operating the plungers.
5. In combination with a cylinder a tympan clamp comprising a frame mounted to swing about the center of the cylinder, grippers carried by the frame and centrally disposed means for operating the same.
6. In combination with a cylinder a shiftable tympan clamp, grippers carried thereby and shiftable therewith and means for operating the grippers organized to permit them to move freely with respect thereto in the shifting movement of the clamp.
7. In combination with a cylinder a tympan clamp, a spring for pressing the same to clamping position and a shiftable abutment supporting the spring whereby it may be moved bodily to release the tympan.
8. In combination with a cylinder a tympan clamp, a spring for pressing the same to clamping position and a manually movable eccentric mounting for the spring.
9. In combination with a cylinder a swinging tympan clamp and a manually operable toggle for operating the same.
10. In combination with a cylinder a

swinging tympan clamp and a spring actuated, manually operable toggle acting on said clamp.

11. In combination with a cylinder a swinging tympan clamp, a toggle connected thereto resiliently tending to break, means limiting movement of said toggle in one direction whereby it holds said clamp closed and manually operable means for reversely breaking the toggle.

12. In combination with a cylinder a tympan clamp comprising a pair of radial arms and a clamping cross-bar, a shaft disposed parallel to said cross-bar and adapted to be rocked manually, crank discs on the shaft, stop means at the bases of the cylinder for said discs, springs secured to said clamp and eccentrically connected to said discs at points lying beyond dead center when said discs are restrained by said stop means.

13. In combination with a cylinder a swinging tympan clamp, a leaf spring having one end secured thereto and a crank disc to which the other end of the spring is secured.

14. In combination with a cylinder a tympan clamp comprising swingable radial arms and a cross-bar, a rock shaft, cranks thereon, springs between the cranks and said clamp and stop means for the shaft to hold said discs as abutments from which the springs act to press the clamp into engagement with the tympan.

15. In combination with a cylinder a swinging tympan clamp and a toggle having a spring arm acting on the clamp and means limiting movement of the toggle in one direction.

16. In combination with a cylinder a swinging tympan clamp and a toggle having a spring arm acting on the clamp, means limiting movement of the toggle in one direction and a shaft providing means for swinging the other arm of the toggle in the other direction.

17. In combination with a cylinder a tympan clamp comprising a frame mounted to swing about the center of the cylinder,

plungers in the frame having gripper fingers and a central axially shiftable cam shaft having sets of cams for alternatively operating the plungers.

18. In combination with a cylinder a tympan clamp comprising a frame mounted to swing about the center of the cylinder, plungers in the frame having gripper fingers and a central axially shiftable cam shaft having sets of cams for alternatively operating the plungers, said plungers being normally supported free of said cams whereby the shaft may readily be shifted between movements of the fingers.

19. In combination with a cylinder a tympan clamp comprising a frame mounted to swing about the center of the cylinder, plungers in the frame having gripper fingers, means for operating the plungers comprising an axial non-rotating shaft and means for shifting the same axially.

20. In combination with a cylinder radially reciprocable plungers carrying gripper fingers and a central axially shiftable shaft having cams adapted to be brought selectively into cooperating relation with said plungers by shifting movement of the shaft.

21. In combination with a cylinder radially reciprocable plungers carrying gripper fingers and a central axially shiftable shaft having edge cams providing rises adapted to be brought selectively into cooperating relation with said plungers by shifting movement of the shaft, said plungers normally supported free of the lower portions of said cams whereby to facilitate the shifting of the shaft.

22. In combination with a cylinder reciprocable plungers carrying gripper fingers and an axially shiftable shaft having cams adapted to operate the plungers by the passage of the same over the cams in the rotation of the cylinder, the shifting of the shaft serving to present different cams to the plungers.

In testimony whereof, I have signed my name to this specification.

ALEXANDER F. BAKER.