Nov. 14, 1933. C. ZARKIN 1,935,306

GRAINING MACHINE

Filed March 12, 1930 3 Sheets-Sheet 1

Fig. 1.

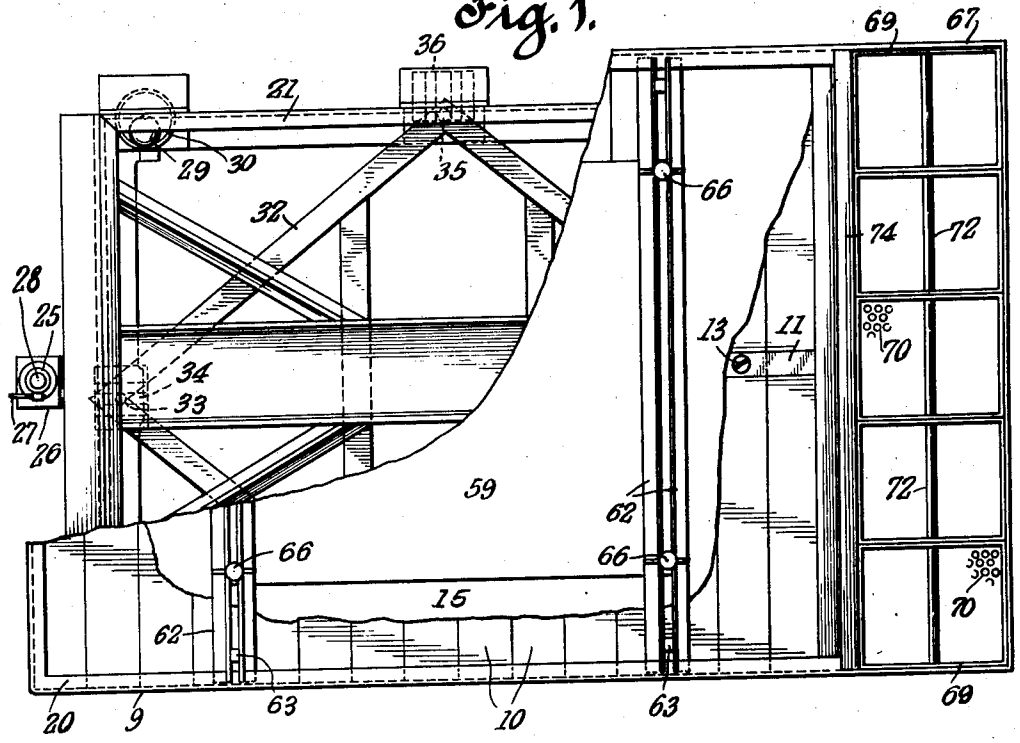
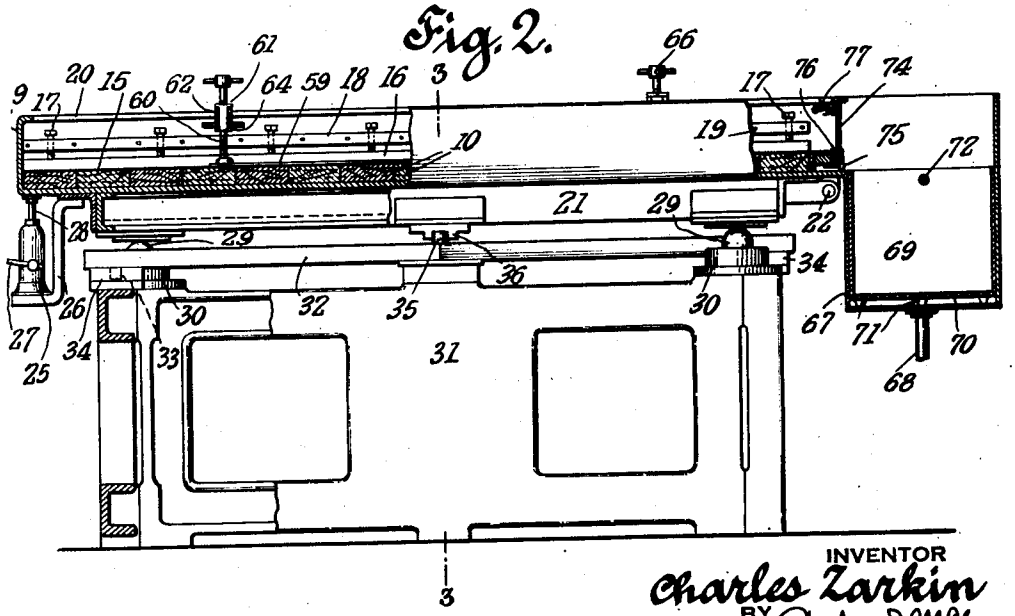


Fig. 2.



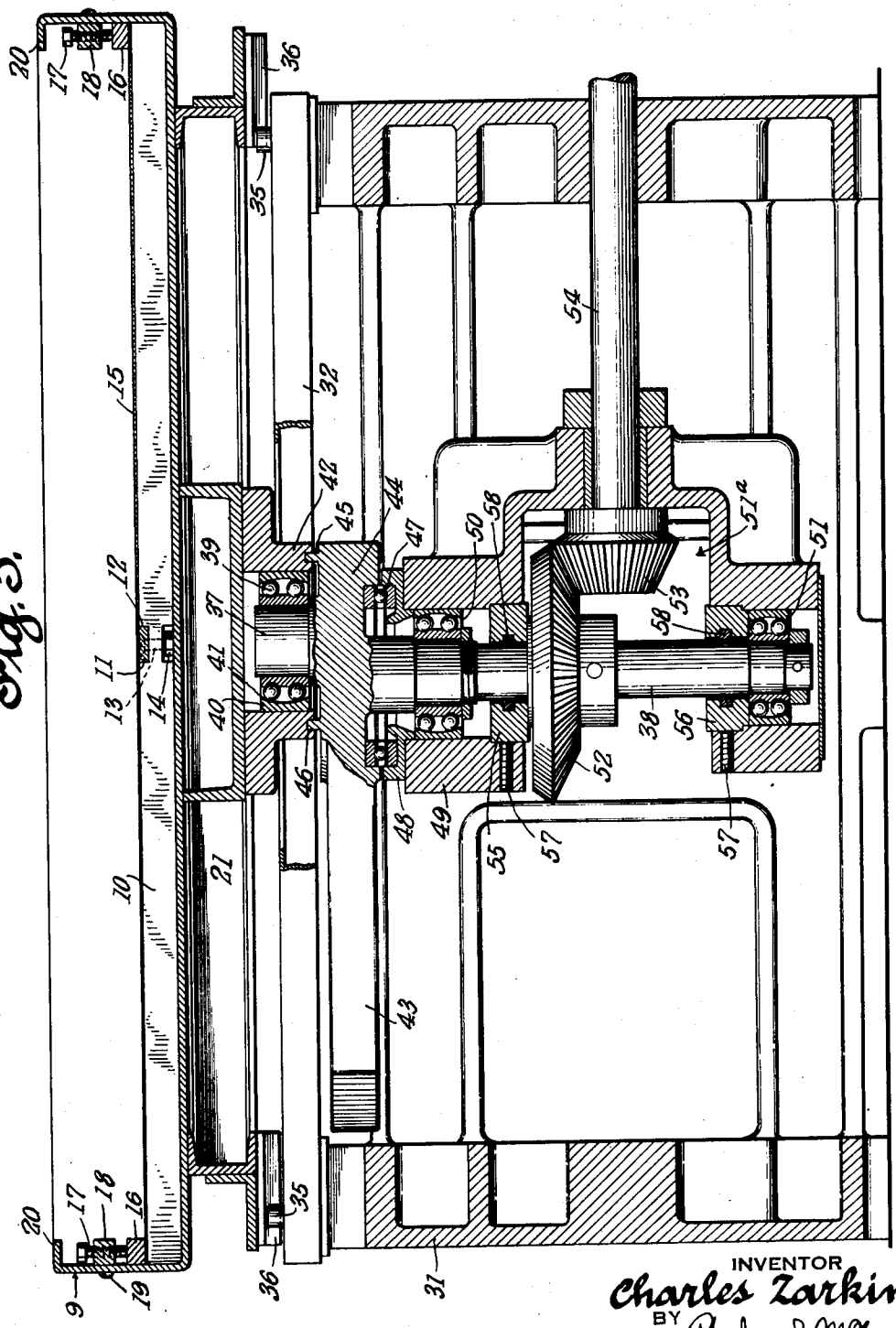
INVENTOR
Charles Zarkin
BY Philip S. McKean.
ATTORNEY

Nov. 14, 1933. C. ZARKIN 1,935,306

GRAINING MACHINE

Filed March 12, 1930 3 Sheets-Sheet 2

Fig. 3.



INVENTOR
Charles Zarkin
BY
Philip S. McLean
ATTORNEY

Nov. 14, 1933. C. ZARKIN 1,935,306

GRAINING MACHINE

Filed March 12, 1930 3 Sheets-Sheet 3

Fig. 4.

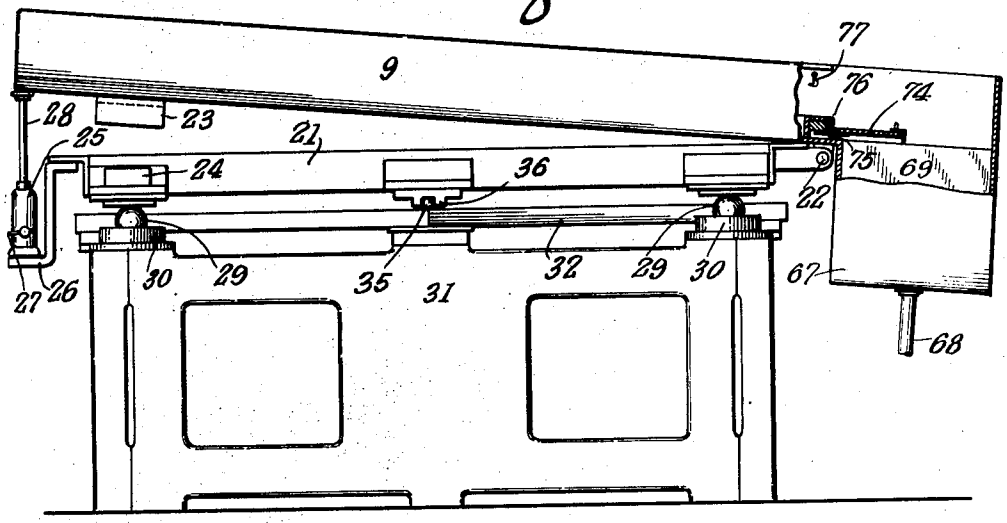


Fig. 5.

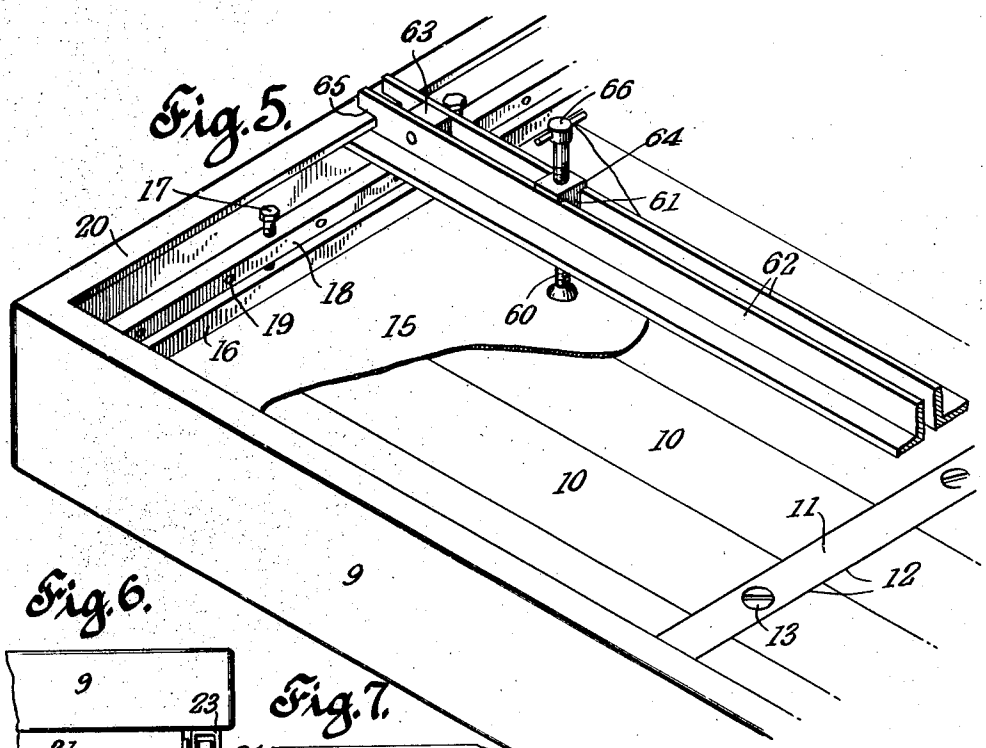


Fig. 6.

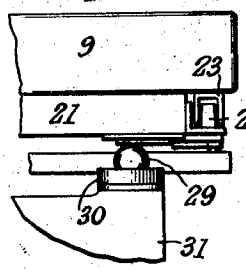
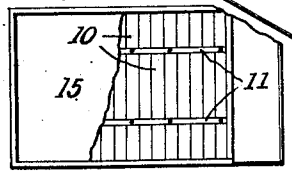


Fig. 7.



INVENTOR
Charles Zarkin
BY
Philip S. McLean
ATTORNEY

Patented Nov. 14, 1933 1,935,306

UNITED STATES PATENT OFFICE

1,935,306

GRAINING MACHINE

Charles Zarkin, New York, N. Y.

Application March 12, 1930. Serial No. 435,059

6 Claims. (Cl. 51—6)

This invention relates to apparatus for "graining" printing plates.

Special objects of the invention are to provide improved apparatus for the purpose, which will operate more smoothly and quietly, at greater speed and with less wear on the parts; which will effect better graining and in less time; in which the plates can be fastened down and removed more readily; which can be cleaned more easily and in which the graining "marbles" may be handled with greater facility than has been possible heretofore.

The objects mentioned and others, which will appear as the specification proceeds are attained by certain novel features of construction, combinations and relations of parts as hereinafter described and broadly claimed.

The drawings illustrate one practical commercial embodiment of the invention, but it is to be understood that the physical structure may be modified as regards this particular disclosure without departure from the true spirit and broad scope of the invention.

Fig. 1 is a broken plan view of the machine; Fig. 2 is a broken and part sectional side elevation of the same; Fig. 3 is a cross-sectional view of the machine on an enlarged scale, this view being taken as on substantially the plane of line 3—3 of Fig. 2; Fig. 4 is a side view partly broken away and in section showing the hydraulic jack on the sub-frame as employed for tilting the tub of the machine to drain the marbles back into the baskets; Fig. 5 is a broken part sectional perspective view of the tub illustrating particularly the removable wood flooring and the various hold-down devices; Fig. 6 is a broken corner detail showing the interlock between the tub and its sub-frame; Fig. 7 is a broken plan view illustrating a slight modification in the tub flooring or lining.

The tub which is designated 9 is of all steel construction in the present disclosure and has a wooden lining or flooring consisting of boards or panels 10 held down by a bar or bars 11, Figs. 5 and 7 seating flush in grooves 12 and held down by screws 13, which take into screw seats such as provided by the nuts 14 welded to the bottom of the tub. Overlying this wooden floor is a metal lining 15 removably secured in place by hold-down bars 16 secured adjustably along the sides of the tub by bolts 17 in the bars 18 secured to the side walls of the tub by external screws 19. In Fig. 3, the boards are shown as grooved on both sides, so that they may be turned over from time to time, so as to use both sides of the boards. This feature is of particular value when the plates are held down by tacks or other fastenings driven down into the wood. In addition to holding the lining and the ends of the boards down snugly in place, the bars 16 provide abutments for the marbles preventing the latter from wearing against the side walls of the tub. In addition to the novel features described, the tub is shown as flanged over at the top as indicated at 20 to reinforce it about the upper edges, to cover over the hold-down fastenings and to provide mounts for the special hold-down clamps later described.

The tub is supported on a sub-frame 21, to which it is hinged at the rear of the machine at 22, Figs. 2 and 4. At the opposite or free end, a mechanical interlock is provided between the tub and its supporting frame in the form of yokes or brackets 23, Figs. 4 and 6, which fit down closely over positioning lugs 24 on the sub-frame.

For lifting and holding the tub in elevated tilted position, special means are provided consisting in the present disclosure of a hydraulic jack 25 mounted on a bracket 26, dependent from the end of the sub-frame, said jack being operable by a hand lever 27 and having a plunger 28 engaging beneath the end of the tub. This lifting mechanism may be operated at any time to lift the tub into an inclined position, such as shown in Fig. 4 and as this mechanism is carried entirely by the supporting structure of the tub, the machine may be kept in operation in the tub in this tilted relation.

The tub frame is supported at the four corners on the balls 29 mounted in the bearing cups 30 on the frame or base 31 and it is guided in an orbital path by a rectangular guide frame 32 slidingly mounted on the base and having sliding connection with the tub frame. As shown in Fig. 1, this guide frame is arranged diagonally on the base and carries at two of its corners, guide lugs or members 33 operating in rectilinear guides 34 on the frame and at its other two corners guide members 35 operating in rectilinear guides 36 on the bottom of the tub frame, the latter guideways being disposed at right angles to those guideways on the base, so as to confine the tub to a definite orbital travel.

A single crank or eccentric is employed for operating the tub, the same being shown as a crank pin 37 on the upper end of a shaft 38 journalled vertically in the central portion of the base frame. This crank pin connects with the tub frame by a special universal ball bearing as shown at 39 in Fig. 3, so that any variations,

such as might occur in the wearing of the ball bearings supporting the four corners of the tub will have no binding or injurious effect on the coupling between the crank shaft and tub. In the illustration, the outer race 40 of the ball bearing 39 is the universal member having a concavely curved track 41 for the double row of balls enabling the bearing to function properly regardless of such misalignment as might occur from unequal wearing of the different parts of the machine. This outer ball race is shown seated in a hub 42 dependent from the bottom of the tub frame.

A counter-balance for the crank pin is shown provided at 43 in Fig. 3, said counterbalance being indicated as an extension of the crank arm 44. This crank arm is illustrated as having an annular upstanding flange 45 at its upper face working in a groove 46 in the underface of the ball race hub 42, thus closing the ball race cavity for holding lubricant and keeping out foreign matter. This sealing flange is shown as arranged concentrically of the crank pin and as forming therefor an annular interlock with the tub frame in all positions of its travel.

The crank arm is illustrated in Fig. 3 as extended in the form of a crank disc and in this form it is utilized as a thrust shoulder for the vertical shaft, a ball thrust bearing being indicated as interposed at 47 between the underside of this crank disc and a stationary step 48, the latter being indicated as carried by a center portion 49 of the main frame. This part of the frame is illustrated as having upper and lower parts carrying the upper and lower annular bearings 50, 51, for the vertical shaft and as being recessed between these bearings at 51 to accommodate the bevel gear 52 on said shaft, which bevel gear meshes with a pinion 53 on the horizontal motor driven shaft 54. The ball bearing seats in the main frame are shown as closed by plugs or collars 55, 56, held removably in place by lock screws 57 and these collars are shown as carrying annular packings 58 for holding the lubricant and keeping dust out of the ball bearings.

As indicated particularly in Figs. 1 and 2, the plates, such as the one shown at 59 may be held down by adjustable clamps in form of clamp screws 60 in the blocks 61, which are slidable longitudinally of the transversely extending angle bars 62. The latter are shown in Fig. 5 as secured together at their ends at 63 in spaced back to back relation and the nut blocks 61 through which the clamp screws are threaded are indicated as having flanges 64 at their upper and lower ends engaging over and beneath the edges of the angle bars to slidably confine these blocks to said bars. The upright flanges of these angle bars are slotted horizontally at their ends at 65 to slidably engage with the inturned edge flanges 20 of the tub. Thus the clamp carrying bars are adjustable longitudinally of the tub and the individual clamps may be set transversely to suit the dimensions of the plates. At the upper ends the clamp screws may be equipped with suitable handles, such as indicated at 66, so that they may be quickly manipulated to grip or release the plates.

At the back the tub is shown as having a trough extension 67 provided with a drain 68 and containing a series of baskets 69 for catching the marbles, these baskets having reticulated bottoms as indicated at 70. Lugs or feet 71 on the bottom of these baskets support them in raised relation in the trough, so that the liquid will readily drain from the baskets into the trough and out the outlet 68. The individual baskets are shown as having cross handles 72 by which they may be readily lifted out or lowered into the trough and in Fig. 1, the baskets are shown as made up in rectangular form closely fitting and entirely filling the trough. Any number of baskets may be employed, depending on the capacity of the machine and it will be evident that this construction provides an easy way of handling a large quantity of graining marbles.

When the machine is in operation, the marbles are confined to the body of the tub by a dam 73, which as indicated in Figs. 2 and 4 is hinged at 75, so that it may be swung down to release the marbles into the baskets. Suitable packing 76 of rubber or the like, may be provided to insure a close substantially water-tight joint about the edges of the dam and suitable means, such as hook fastenings 77 may be provided for releasably securing the dam in the upright position.

The tub is preferably made of one piece of sheet steel and while the wood flooring is desirable for most purposes, the same may be readily removed and not used, if conditions so require. The hydraulic jack is easily operable and serves both to lift and to hold the tub in any desired inclined relation, the machine being operative while the tub is thus inclined, the latter feature aiding in the washing and cleaning operations. The self-aligning bearing which forms the coupling between the tub frame and the drive crank is especially important, assuring continued smooth operation of the machine in spite of such mis-alignment as may occur in such a heavy piece of apparatus subjected to such rough conditions of use.

The wood flooring in addition to forming a cushion serves to effectively brace the steel tub.

What is claimed is:

1. In a graining machine, a graining tub, clamp screws mounted along the inner walls of the same, clamp bars engaged by said screws and a flooring for the tub removably and adjustably secured in place by said clamp bars.

2. In a graining machine, a graining tub, rails along the inner wall of said tub, bolts screw-threaded in said rails, clamp bars engaged by said screws and flooring for the tub adjustably and removably held in place by said clamp bars.

3. In a plate graining machine, the combination of a graining tub having inwardly extending edge flanges, clamp supporting bars having forked ends in sliding engagement with said edge flanges and hold-down clamps slidingly adjustable longitudinally of said bars.

4. A plate graining machine, comprising a tub having inwardly extending flanges along the sides and above the bottom of the same, but not extending continuously the full length of the tub, so as to leave ends of said flanges exposed, a clamp bar having slotted ends engageable over the thus exposed ends of the tub flanges and slidable longitudinally over said flanges to different positions in the tub and adjustable plate holding clamp means carried by said clamp bar.

5. A plate graining machine, comprising a tub having inwardly extending flanges along the sides and above the bottom of the same, but not extending continuously the full length of the tub, so as to leave ends of said flanges exposed, a clamp bar having slotted ends engageable over the thus exposed ends of the tub flanges and slidable longitudinally over said flanges to different positions in the tub, adjustable plate holding clamp means carried by said clamp bar, said tub having a

trough at one end and said tub flanges being discontinued above the trough to leave full access to said trough.

6. A plate graining machine, comprising in combination, a base frame, a tub frame mounted for graining movement on said base frame, a graining tub hingedly mounted on one end of said tub frame and extending over the opposite end of said tub frame, a supporting step dependent from and carried by said opposite end of the tub frame and projecting away from said tub frame clear of the base frame in the graining movements of the tub frame on the base frame and a hoisting jack seated on said step and accessible for ready operation at the end of the base frame, the tub having an overstanding portion engageable by said jack and whereby the tub may be tilted to various angles and held supported at different selected inclines.

CHARLES ZARKIN.