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Ellison et al.

[11] **3,783,786**

[45] **Jan. 8, 1974**

[54] **SELF-INKING HAND STAMP**

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[52] **U.S. Cl.** **101/333,** 101/103

[51] **Int. Cl.** **B41f 1/50**

[58] **Field of Search** 101/103, 104, 105, 101/106, 111, 327, 333, 334

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Assistant Examiner—E. M. Coven
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[57] **ABSTRACT**

A self-inking hand stamp includes a novel positively indexing, quick-settable character band printing unit structure and a novel inking structure, as well as a simple, rugged and durable arrangement of parts for extended life in hard usage.

16 Claims, 11 Drawing Figures

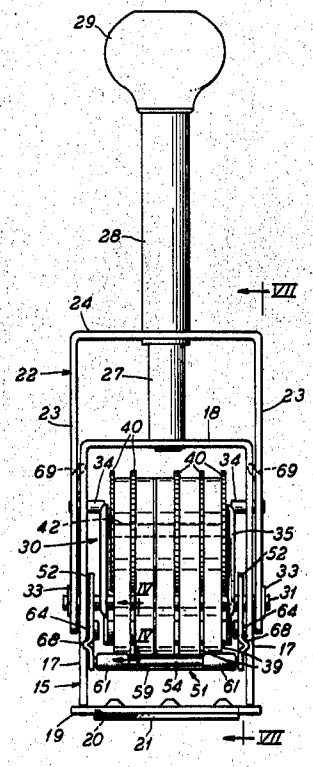


Fig. 1

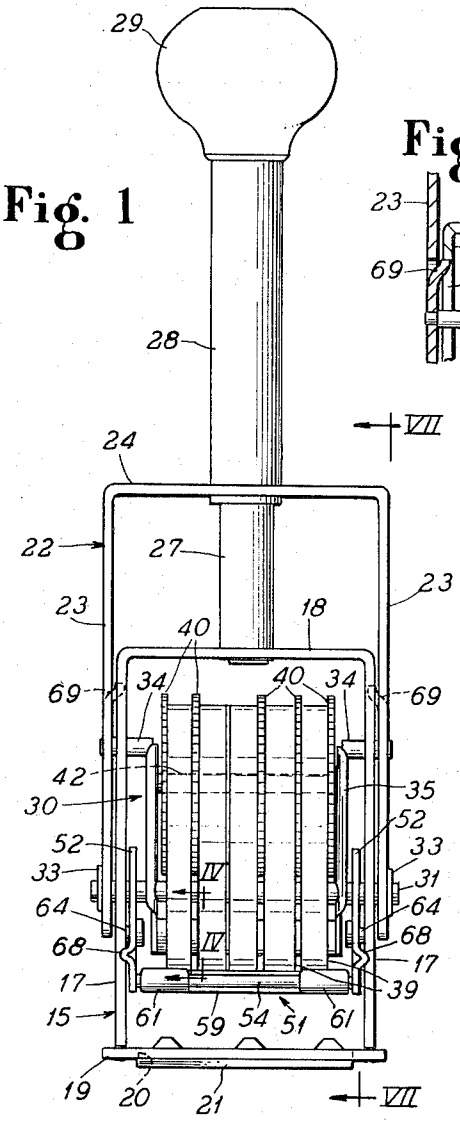
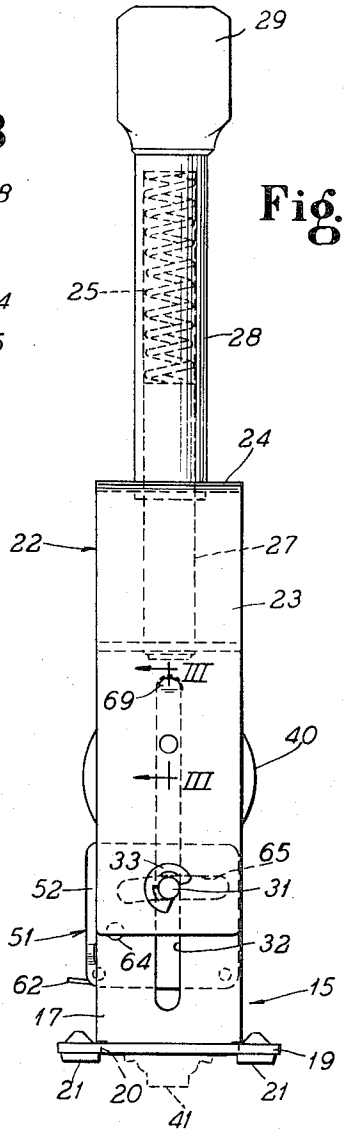


Fig. 3

Fig. 2



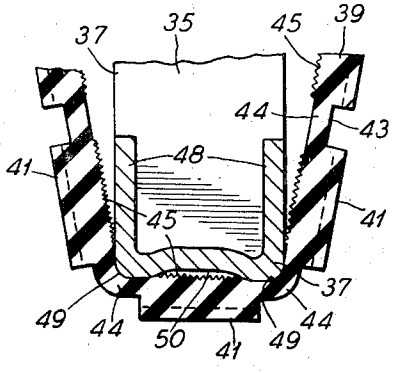


Fig. 4

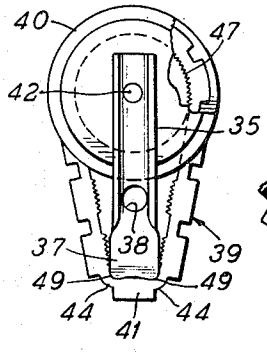


Fig. 5

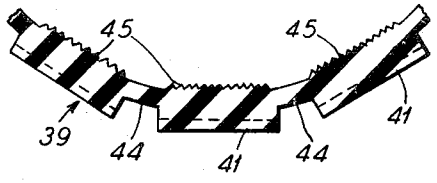


Fig. 6

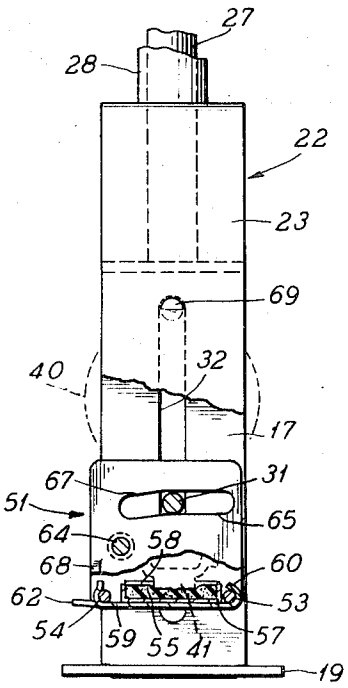


Fig. 7

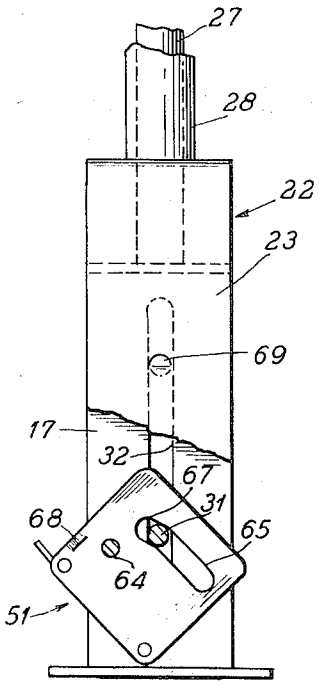


Fig. 8

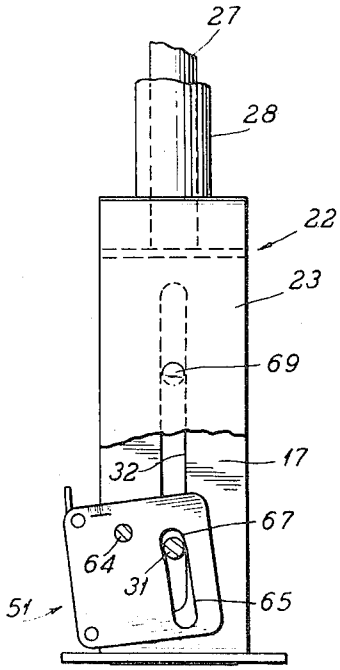


Fig. 9

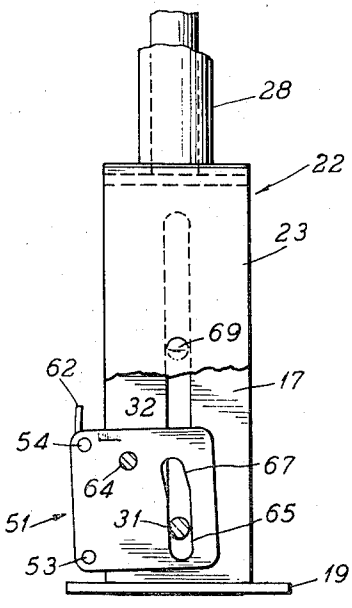


Fig. 10

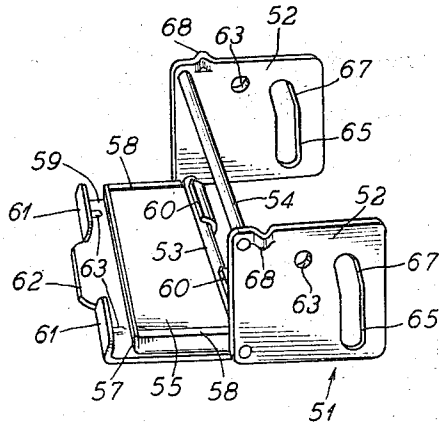


Fig. 11

SELF-INKING HAND STAMP

This invention relates to self-inking hand stamps, and is more particularly concerned with such hand stamps especially suitable for use in marking merchandise packages in supermarkets and the like.

Hand stamps of the character indicated as heretofore provided have had various deficiencies, some of which are points of excessive wear so that the useful life is short, complexities of structure which render the units costly, difficulties in supplying ink to the ink pads, difficult manipulation of the character-carrying bands of the printing heads or units, inefficient character registration, tendency for the character-carrying bands to drift in use.

An important object of the present invention is to overcome the foregoing and other disadvantages, defects, inefficiencies, shortcomings, deficiencies and problems in prior structures in a new and improved self-inking hand stamp, as will hereinafter become apparent.

Another object of the invention is to provide a new and improved self-inking hand stamp of rugged, efficient, simple and durable construction.

A further object of the invention is to provide a new and improved self-inking hand stamp which is smooth in operation and has a minimum number of relatively moving operating parts.

Still another object of the invention is to provide a new and improved hand stamp of the character indicated which eliminates pressure wear points.

Yet another object of the invention is to provide a new and improved efficiently operating printing unit structure for hand stamps.

A still further object of the invention is to provide new and improved indexing means for the printing units of hand stamps.

A yet further object of the invention is to provide a new and improved inking device for self-inking hand stamps.

Other objects, features and advantages of the invention will be readily apparent from the following description of a preferred embodiment thereof, taken in conjunction with the accompanying drawings, although variations and modifications may be effected without departing from the spirit and scope of the novel concepts embodied in the disclosure, and in which:

FIG. 1 is a front elevational view of a self-inking hand stamp embodying features of the invention;

FIG. 2 is a side elevational view of the hand stamp of FIG. 1;

FIG. 3 is a fragmentary sectional detail view taken substantially along the line III—III of FIG. 2;

FIG. 4 is an enlarged fragmentary sectional detail view taken substantially along the line IV—IV of FIG. 1;

FIG. 5 is a side elevational view of the printing unit of the hand stamp;

FIG. 6 is a fragmentary sectional view of one of the character-carrying bands, similar to FIG. 4 but relaxed as disassembled from the printing unit or head;

FIGS. 7 to 10, inclusive, are illustrative side elevational views showing various positions of the inking device in the course of operation of the hand stamp, the views being taken substantially along the line VII—VII of FIG. 1; and

FIG. 11 is a perspective view of the inking device showing the ink pad in its open position for application of ink thereto.

A self-inking hand stamp embodying features of the invention, as illustrated in FIGS. 1 and 2 comprises a main body frame 15 of generally inverted U-sahped structure having respective coextensive spaced leg vertical side bars 17 connected by a head bar 18 and having there lower ends fixedly secured to a base plate 19 having therethrough a central clearance opening 20 between the legs, and carrying elastomeric cushioning pads 21 on its lower face.

Mounted on and vertically reciprocable relative to the body frame is a printing unit actuating frame 22 of inverted U-shape having opposite coextensive arms 23 which are spaced apart slightly greater than the frame bars 17 so as to be freely reciprocably movable vertically therealong and are desirably of the same width, being connected integrally by a head bar or web 24. Means for normally biasing the frame 22 upwardly relative to the frame 15 comprise a coiled compression spring 25 thrusting at its lower end against an upwardly projecting stem 27 centrally fixed on the head bar 18 and projecting into a tubular spring housing 28 fixed centrally on and opening downwardly from the head bar 24 and provided at its upper end with a blind end shoulder against which the upper end of the spring 25 thrusts. In addition, the tubular member 28 may serve as a handle for manipulating the hand stamp and be equipped for this purpose with a suitable head knob 29. If preferred, of course, the frame 22 may be employed as a handle, with digital pressure applied to the head bar 24 in depressing the printing frame against bias of the spring 25.

Means are provided for guiding the arms 23 along the bars 17 and for supporting a printing unit 30 to be actuated reciprocably with the printing frame 22. For this purpose, a guide pin 31 extends through respective coextensive vertical guide slots 32 in the frame bars 17 and is connected to the respective arms 23 by extending through the lower portions thereof, being connected against displacement by means of resilient snap spring retaining washers 33 connected into terminal end annular grooves in the projecting end portions of the pin. Spaced upwardly from the pin 31 are respective guide studs 34 fixed to the arms 23 and extending inwardly in coaxial alignment through the vertical guide slots 32.

Replaceable mounting of the printing unit 30 within the body frame 15 in a manner to be operated reciprocably in straight line vertical manner by means of the printing frame 22 is effected by means of the pin 31 and the studs 34. Accordingly, the pin 31 extends as a shaft in supporting relation through spaced vertical upwardly extending arms 35 of a generally U-shaped printing unit frame provided on lower portions thereof above a rigid integral connecting bridge bar 37 with coaxially aligned bearing apertures 38 (FIG. 5) through which the shaft pin 31 extends in supporting relation. For rigidity the arms 35 are generally outwardly channel-shaped and at their upper ends receive the inner end portions of the studs 34 cooperating with the shaft 31 to hold the printing unit frame in stable, vertical, centered working relation within the body frame 15.

Except for certain improvements, as will be explained, the printing unit 30 is similar to customary units of this type, including rubber character-carrying

bands 39, in this instance five, mounted on and about the bar 37 at the lower end of the unit and about respective adjustment wheels 40 at the opposite end of the unit each provided with a knurled edge digitally engageable adjustment flange of a diameter to project sufficiently beyond printing characters 41, such as numbers, punctuation marks or letters in series on the outer faces of the bands to enable convenient belt adjusting rotation of the wheels without contacting the characters by the manipulating fingers. Coaxial individually rotatable mounting of the wheels 40 is effected on a shaft 42 secured fixedly to and between the upper end portions of the arms 35.

Means are provided for not only efficient positive adjustment driving of the belts or bands 39 by the wheels 40, but also effective indexing and retention of the bands in adjusted positions thereof. To this end, the endless bands 39 are desirably molded from an elastomer such as neoprene of 40–45 durometer and mounted on the printing unit under slight tension. Elasticity of the respective bands is improved by providing fairly deep transvrese grooves 43 between the relatively stiffer areas of the bands providing the characters 41 which have flat face planes. The character areas are thus separated by relatively flexible elastic integral webs 44, which are preferably molded in a slight inside concave outside convex form longitudinally. Between the webs the back faces of the respective bands are provided with traction means desirably comprising transverse serration-like resilient rib teeth 45 which are dimensioned to mesh with and are complementary to similar transverse rigid rib teeth 47 on the drum perimeters of the wheels 40. This effects a fairly positive drive relationship between the wheels and bands and eliminates any need for backing on the bands, enabling a smoother, freer, easier adjustment manipulation of the bands through the wheels 41.

For indexing, a novel cooperative relation is provided between the printing unit frame bar 37 and the bands 39. As is customary, the bar 37 provides a rigid thrust backing for the character areas of the bands to enable applying printing impressions of the printing characters 41 aligned on the bar onto objects against which impressed by thrusting the printing end of the printing unit through the clearance opening 20 in the base 19. For utmost rigidity, the bar 37 has spaced parallel reinforcing flanges 48 (FIG. 4). For indexing efficiency, the bar 37 is provided with relatively small radius side edge indexing shoulders 49 which are properly spaced to register with the respective webs 44 which connect each of the character areas aligned with the thrust face of the bar 37 with the adjacent character areas in each instance. By reason of the slight tension under which the bands 39 are maintained, the web areas 44 in engagement with the indexing shoulders 49 are slightly stretched, as will be apparent on comparison of FIGS. 4 and 6, whereby the relatively stiffer character areas at each end of each of the stretched web areas 44 is pulled toward and relatively hugs the bar at each side of each of the shoulder ribs 49 and resists drifting of the respective band longitudinally thereof, whereby the character area in printing orientation on the bar 37 will remain in proper alignment with all of the other character areas in the printing orientation until deliberate readjustment of the respective bands is effected by manipulation of the adjustment wheels 41.

Further assistance in the printing character indexing and retention is afforded by the separation between the areas of gripper teeth 45 at the backs of the webs 44, so that there is an inherent, readily sensibly detectable snap-on grabbing of the respective web areas 44 onto the shoulder 49 at each end of each of the character areas as the respective belt is longitudinally motivated to move a character area across one of the shoulders and into position on the thrust face of the bar 37. Not only does the relatively greater stiffness of the character area contribute to this action, but the gripping teeth 45 on the back of such character area provides a mild frictional resistance to movement of the character area across the shoulder so that immediately on passing from the shoulder there is a momentary relief of the resistance, sensibly indicating that the selected character area has been moved into printing position. This feature is enhanced by providing the thrust face of the bar 37 with an inward depression 50 longitudinally between the shoulders 49, within which the gripper teeth 45 of the printing character area are received. Through this arrangement the teeth 45 of the imprinting character area assist in the detenting and also in the retention of the respective character band against longitudinal drift.

The depression 50 also enables slight inward yielding for marking on uneven surfaces, or angular or tilted surfaces.

Self-inking means are provided automatically operative to apply ink to the printing characters aligned along the bar 37. According to the present invention, such means comprise an inking device 51 constructed and arranged to move automatically into inking position when the printing unit 30 is in retracted position within the body frame 15 and to move automatically into clearance relation to the printing unit when the printing unit is actuated into printing position by depressing the printing frame 22 relative to the body frame 15. Further, the inking device 51 is constructed and arranged for greatly facilitating supplying it with ink. To this end, the inking device 51 (FIG. 11) comprises a pair of body side plates 52 of identical, coextensive construction in allochiral spaced parallel relation, desirably of generally rectangular outline, slightly longer in one face direction than in the other direction and rigidly connected together along one of their aligned shorter edges by a pair of spaced parallel coextensive rods 53 and 54, one of which is fixedly secured adjacent to one corner area and the other to the other corner area adjacent to such edge of the plates.

In addition to serving as frame connectors for the side plates, the rods 53 and 54 provide means for supporting an ink pad 55. Such pad comprises a suitable panel of ink-carrying and applying material. Commonly an absorbent felt pad has been used for this purpose, but significantly improved results are obtained by means of a pad of suitable thickness of interconnected cellular resilient foam material such as foam latex, polyvinylchloride foam, or the like having minutely dimensioned porosity so as to be possessed of large ink capacity but strong and fairly uniform and adequately dense but porous applicator surface. It has been found that such material provides a continuously uniform application of ink to the printing characters as long as there is any ink on and in the pad.

For supporting the ink pad 55 operatively, an ink pad tray having narrow overhanging pad retaining flanges

58 along opposite edges is mounted fixedly on a panel 59 arranged to be carried by the rods 53 and 54. The tray 57 may be formed from relatively thin sheet metal and the panel 59 from heavier gauge sheet metal and the two members secured together as by means of spot welding.

In order to facilitate inking of the pad 55, the supporting panel 59 is arranged to be hingedly connected to one of the supporting rods and latchingly engaged with the other of the rods. To this end, the supporting panel 59 is dimensioned to be received between the margins of the side plates 52 having the rods 53 and 54 and with opposite margins of the panel 59 engageable with the respective rods. Along the edge defining one of the panel margins it is provided with means for hingedly securing it to one of the rods, in this instance the rod 53. Such hinging means desirably comprise a pair of coextensive spaced hinge curl flanges 60 engaging partially around the rod 53 sufficiently to retain the rod between the hinge flanges and the adjacent edge of the tray 58, enabling pivotal swinging of the inking pad supporting panel between an open, extended position as shown in FIG. 11 and a closed, operating position as shown in FIGS. 1 and 7. In the operating position, a pair of snap-latch flanges 61 separated by a handle flange 62 along the free margin of the plate 59 engage in frictional digital pressure-releaseable relation with the rod 54. Reinforcement of the latching margin is effected by reinforcing ribs 63 extending normal to the flanges 61 but clear of the adjacent edge of the tray 57. Through this arrangement, the ink pad carrier 59 is adapted to be manipulated by means of the handle flange 62 between the open position and the closed position with the retaining spring latch flanges 61 effectively retaining the carrier in the operating position on and between the rods 53 and 54 and enabling ready opening of the pad by snapping the flanges 61 away from the rod 54 when it is desired to gain access to the ink pad 55 for inking purposes.

Mounting of the carriage of the inking device 51 is in a manner to swing automatically between inking and clearance positions relative to the unit 30 responsive to movements of the printing frame 33 between retracted and printing positions. For this purpose, the sides 52 are pivotally mounted on the side bars 17 between them and the unit 30 to be actuated by a coupling with the shaft 31. Hence, the side plates 52 are provided with coaxially aligned bearing apertures 63 eccentrically adjacent to the long edge nearest the frame bar 54 and through which are engaged respective headed pintles 64 fixed upon the inner sides of the respective side bars 17 so that the device 51 is freely pivotally movable between the inking position shown in FIG. 7 and the printing unit clearing position shown in FIG. 10, also exemplified in FIG. 11. Operative coupling with the shaft 31 is effected through respective aligned, coextensive generally dog leg control cam slots 65 in the end plates 52 adjacent to the free edges of the plates and with their ends adjacent to the longitudinal edges of the plates. Their spacing and relationship to the eccentric pivot bearing apertures 63 is such, together with their particular cam contour, that when the printing unit 30 is in its retracted position the inking device 51 is drawn inwardly to press the ink pad 55 lightly against the printingly oriented characters along the printing pressure bar 37 as best seen in FIG. 7. During a printing stroke, as the printing frame 22 is depressed, the printing device is progressively swung into the clearance position as exemplified in FIGS. 8, 9 and 10. For this purpose, the control slots 65 shift from the generally centered relation to the shaft 31 as shown in FIG. 7, to an angular relatively short section 67 of the control slots nearest the pivots 64, as shown in FIG. 8 and FIG. 9, and then in the last part of the stroke the shaft 67 moves downwardly along the major length of the slots 65 which is substantially parallel to the adjacent free edge of the respective side plates, as shown in FIG. 10. This provides a smooth, minimum reaction driving relationship between the side plates 52 and the shaft 67 such that operation is virtually resistance-free and with minimum liability to wear on the shaft 67 or along the edges defining the slots 65. In the clearance position easy access to the ink pad is available since the latched edge of the supporting panel 59 is uppermost and the hinge rod 53 is lowermost so that by swinging the panel 59 into the open position, the ink pad 55 is exposed outwardly and upwardly in convenient freely accessible relation for inking.

In order to assure a square-on engagement of the inking pad 55 with the characters to be inked, positive stop means are provided on the side plates 52 engageable with the side bars 17. In a desirable form, the stop means comprise stop lugs 68 integral with and deformed from the longitudinal margins of the plates which are adjacent to the rod 54, and with the lugs adjacent to the rod connections so as to be spaced toward the rods relative to the pivots 64. Dimensions of the stop lugs 68 are such that when the inking device 51 has been swung into the inking position by action of the shaft 31 in the control slots 65, the lugs will make contact with the adjacent edges of the frame bars 17 substantially as the inking pad 55 is parallel to the faces of the printing characters in printing position. This assures uniform inking.

To relieve the stop lugs 68 from undue impact wear, especially in the rapid operation of the hand stamp, supplementary stop means are provided. Desirably such stop means are on the frames 15 and 22 and constructed and arranged to limit retraction movement in the return stroke of the printing frame 22 substantially coincident with stopping engagement of the lugs 68 with the frame bars 17. In a durable and efficient construction, such stop means comprise respective stop lugs 69 struck inwardly from and integral with the frame legs 23 spaced above and in general vertical alignment with the guide studs 34 and adapted to project in free clearance relation into the slots 32. For maximum efficiency, the stop lugs 69 are of a rounded or arcuate crown form as best seen in FIG. 2 so as to engage in the arcuate upper terminus of the respective slots 32 (FIG. 3). This provides maximum contact area, and inertia absorption ability.

From the foregoing it will be apparent that the hand stamp of the present invention is direct and smooth in operation, has a minimum of relatively moving parts, wear pressure points are virtually eliminated on the relatively acting elements of the construction. Adjustments of the character bands is not only facilitated but proper alignment and maintenance of alignment of the printing characters is assured. Self-inking is greatly improved together with utmost facility and convenience in supplying the ink pad with ink by merely swinging down the carrying panel as shown in FIG. 11 when the inking device is in the clearance position demonstrated

in FIG. 10. Overall length of the hand stamp is maintained minimal by the unique manner in which the inking device swings the ink pad in underhand relation to the printing unit and in the printing stroke clears the inking pad in an arcuate path outwardly and upwardly into a position alongside and clear of the depressed printing unit with the slot terminus shoulder.

Not only is efficient indexing of the character bands enabled but where for any reason there is any longitudinal misalignment of a character at the thrust bar, automatic self-alignment or adjustment occurs as the printer is used, so that proper alignment of the characters in printing position is always assured.

It will be understood that variations and modifications may be effected without departing from the spirit and scope of the novel concepts of this invention.

We claim:

1. A hand stamp assembly comprising an upright body frame having matched elongated slots including a base to be thrustingly engaged with an object to be imprinted, a printing frame, a printing unit within the body frame and operatively coupled with said printing frame by means of connecting means from the printing unit to the printing frame riding in said slots, said printing unit having character-carrying means movable to shift different printing characters thereon into printing position facing toward said base, and means normally biasing the printing frame and thereby the printing unit into a retracted position on the body frame away from said base and from which position the printing frame can be moved in opposition to the biasing means to drive the printing characters into imprinting engagement with an object against which the base is thrustingly engaged, including:

a self-inking device comprising a carriage having side plates pivotally attached within said body frame and printing frame and carrying an inking pad therebetween; said plates having matching control cam slots therein; said connecting means being operatively engaged in said cam slots and said elongated slots to effect swinging of the carriage between a position wherein the inking pad is in inking contact with the printing characters which are in printing position in a retracted relation of the printing frame and the printing unit relative to said frame and base, and a clearance position relative to said printing frame and the printing unit wherein the inking pad is located at one side of the body frame to permit movement of the printing frame and the printing unit in opposition to said biasing means and relative to said body frame to effect imprinting by the inked printing characters upon an object against which the base is thrust.

2. An assembly according to claim 1, wherein said body frame includes stop surfaces, and stop lug means on said plates of the carriage engageable with said stop surfaces to assure proper registration of the ink pad with the printing characters.

3. An assembly according to claim 2 having stop lugs projecting from said printing frame into said longitudinal slots and engageable with a stop surface provided at an end of said slots in the retracted position of the printing frame, said engagement of the carriage plate lugs with the body frame stop surfaces and engagement of the printing frame lugs with said slot end stop surfaces being coordinated to relieve the stop lugs on the carriage plates from undue impact wear.

4. An assembly according to claim 1, wherein said body frame comprises spaced vertical bars and said printing frame comprises spaced vertical legs reciprocably movably positioned along the outer sides of said frame bars, said frame bars having said matched longitudinal slots therein, and said printing frame legs having lugs thereon projecting into said slots, said slots having end stop surfaces engaged by said lugs in the retracted position of the printing frame.

5. An assembly according to claim 4, including a shaft pin connecting said printing head with said printing frame legs and extending through said vertical slots spaced from said lugs, and studs carried by said legs and extending through said longitudinal slots intermediate said shaft pin and said lugs and engaging with means on said printing unit and cooperating with said shaft pin to hold the printing unit in stable, vertical, centered working relation within the body frame, said shaft pin extending through said cam slots in the inking carriage plates and comprising said coupling means.

6. An assembly according to claim 1, wherein said character-carrying means comprise a yieldable band having a series of printing characters thereon, said printing unit including a transverse rigid thrust bar facing generally toward said base and having a surface facing toward the back of said band and of a width to receive selected printing character-carrying areas of the band in printing position, said surface having a depression therein, and said back of the band being normally spaced from said surface across said depression but engaging the thrust bar at opposite sides of the depression, whereby inward yielding into said depression of the band is permitted when the printing characters in printing position encounter uneven, angular or tilted surfaces during imprinting marking of an object.

7. An assembly according to claim 6, said band having on the back thereof indexing means projecting partially into said depression but remaining normally spaced from said surface within the depression except at the opposite sides of the depression.

8. An assembly according to claim 7, wherein said indexing means comprise resilient projections on the back of the band.

9. An assembly according to claim 8, said projections on the back of the band comprising transverse serration-like rib teeth, and band moving wheel means on the printing unit having complementary transverse rigid rib teeth meshing with said rib teeth on the band.

10. An assembly according to claim 9, said rib teeth on the band being provided in respective areas having a length substantially equal to the width of said depression and the back of the band being free from teeth at both ends of the tooth area, whereby in the movement of the band across said thrust bar said teeth provide a mild frictional resistance to movement across the portions of the bar at opposite sides of said depression and immediately on passing of the tooth area from said portions of the bar into registration with said depression there is relief of the resistance and sensible indication that the associated printing character has been moved into printing position.

11. An assembly according to claim 1, said carriage including an ink pad supporting panel hingedly mounted on and between said carriage plates, and means normally latching said panel in position on said plates to support the ink pad for its inking function and the latching means being releasable for swinging the

panel away from the inking position for access to the inking pad to supply ink thereto.

12. An assembly according to claim 11, said latching means including a latching projection on said panel, and a transverse rod secured to and between said panels and engageable by said latching projection.

13. An assembly according to claim 11, comprising a pair of spaced rods secured to and between said carriage plates, said panel being hingedly connected to one of said rods and the latching means comprising a structure releasably engageable with snap-action with the other of said rods.

14. An assembly according to claim 11, said panel having a tray secured thereto, and said inking pad being carried by said tray.

15. An assembly in accordance with claim 1 in which said matched elongated slots have a shoulder at the end farthest from the base, stop lugs on the printing frame extend into said slots and engage said shoulders to limit movement of the printing frame to said retracted position, said connecting means from the printing unit to the printing frame comprises a shift pin secured to the printing frame at a locus spaced from said lugs, and extending through said matched elongated slots; and studs fastened to said printing frame, intermediate said shaft pin and said lugs, and extending through said matched elongated slots to engagement with the printing unit.

16. An assembly according to claim 11, including a snap latch mechanism on said panel and said carriage for normally retaining the panel in place on the carriage to hold the pad in position for inking the printing characters.

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