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 [21] Appl. No. **752,362**
 [22] Filed **Aug. 13, 1968**
 [45] Patented **June 29, 1971**
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[54] **COLORING AND PRINTING EMBOSSED CARDS**
4 Claims, 5 Drawing Figs.

[52] U.S. Cl. **101/27,**
101/287, 101/336, 197/6.6
 [51] Int. Cl. **B41b 5/00,**
B41b 1/38, B41f 31/16
 [50] Field of Search **101/27, 31,**
8, 9, 10, 11, 287, 297, 336, 95, 96; 197/6.6, 6.7,
6.4, 6.5, 6.2

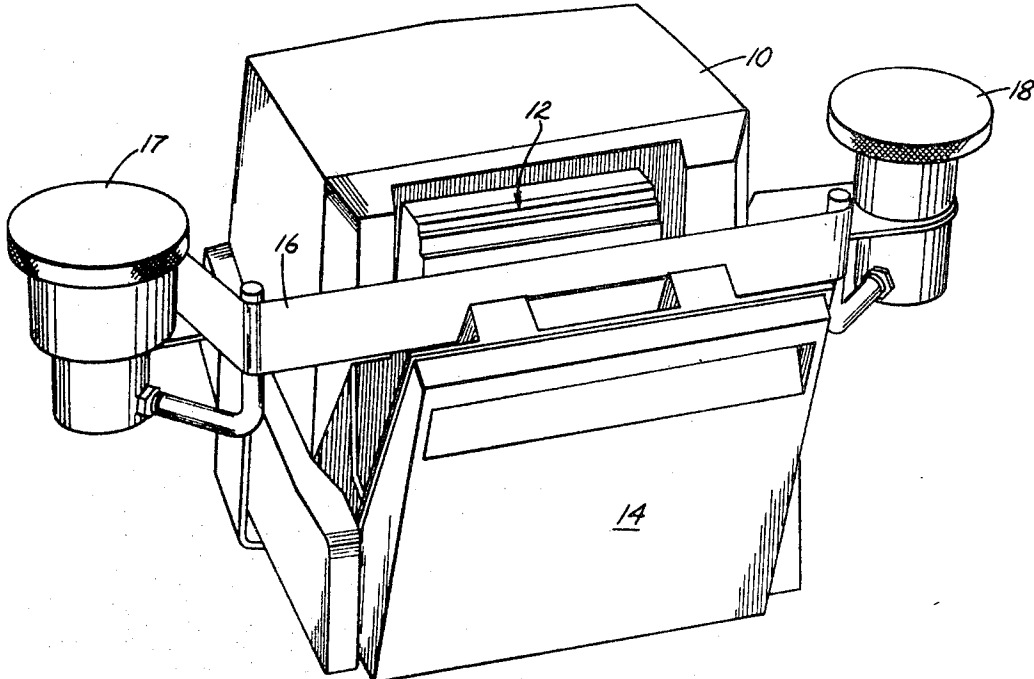
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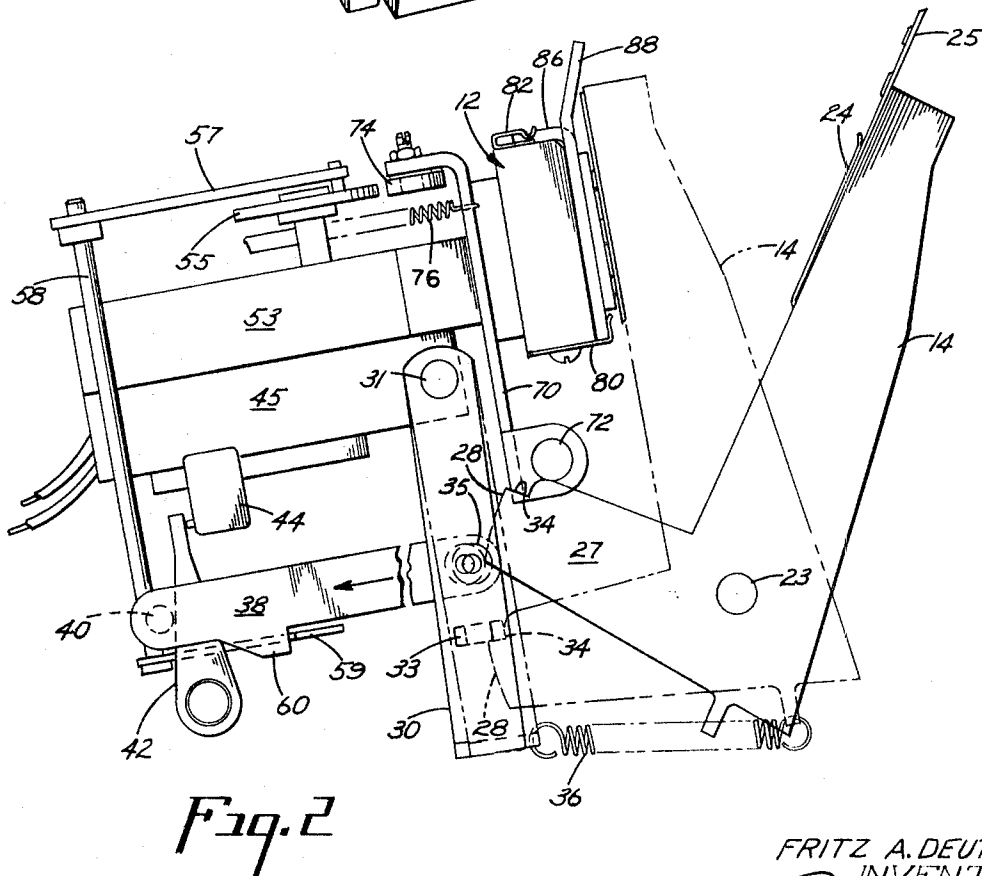
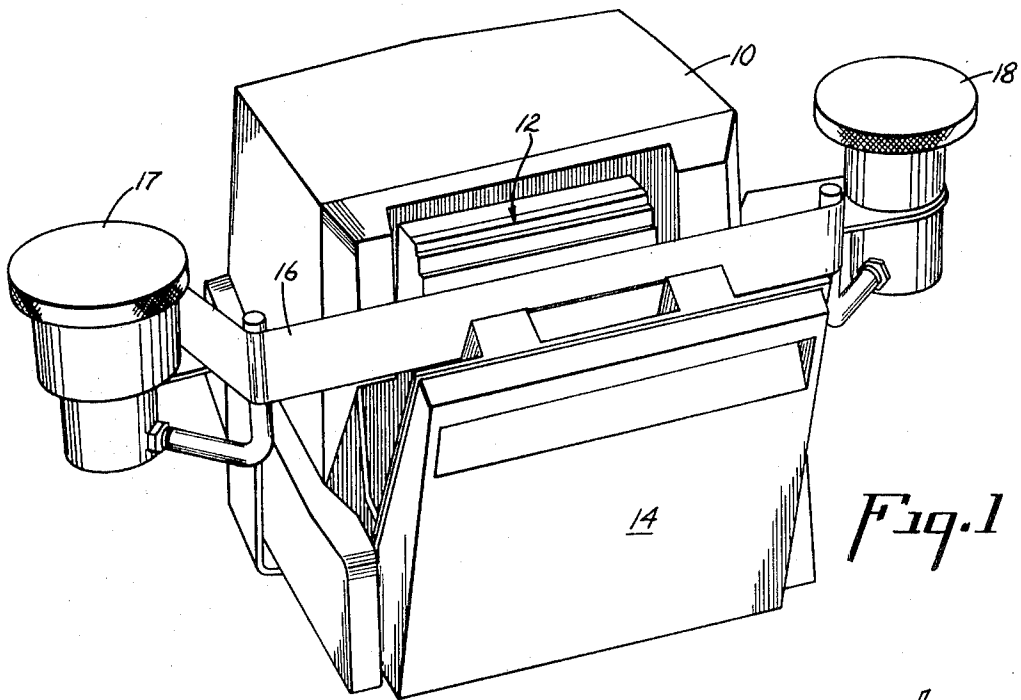
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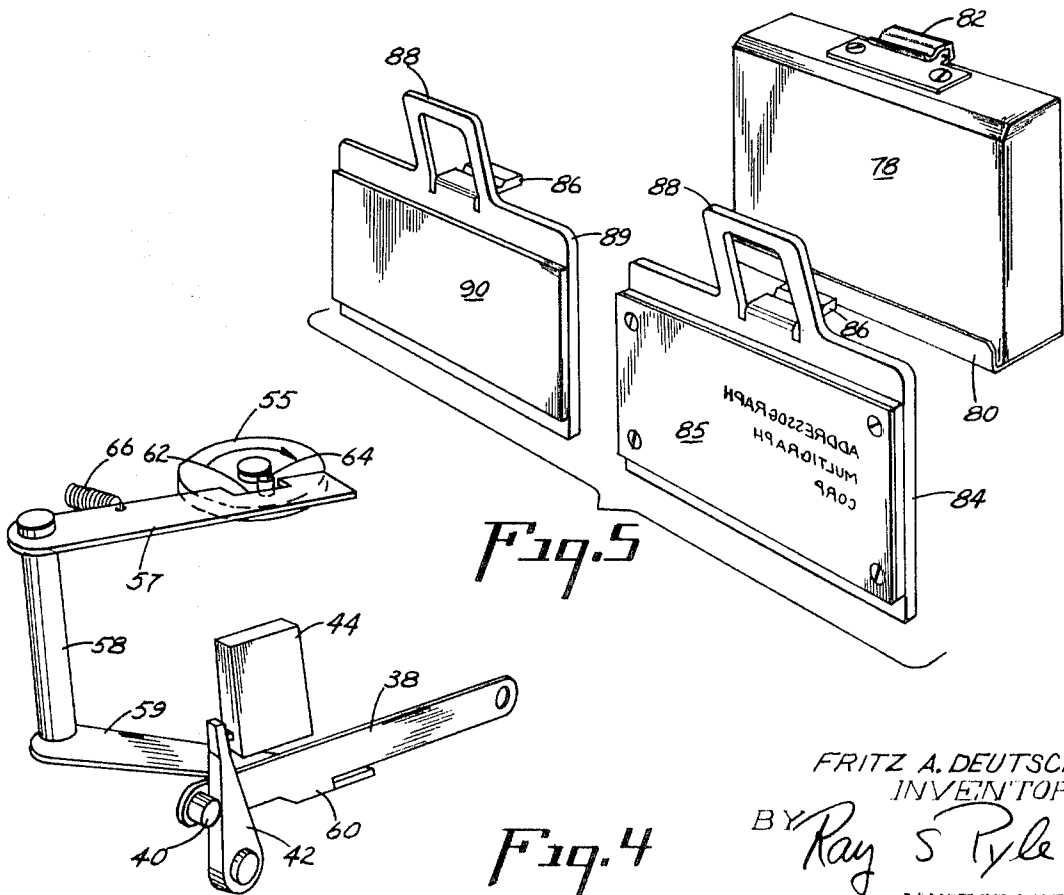
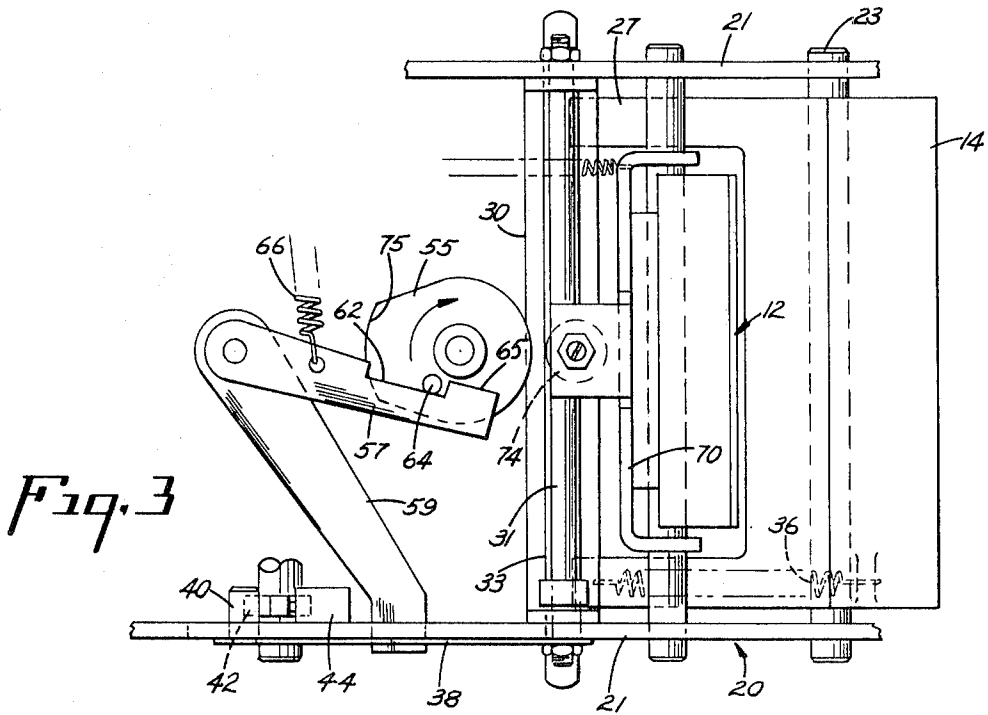
ABSTRACT: A frame provides sideplates to support pivoted members with stability and to house a power motor with associated equipment.

The machine bed is a pivoted gate mounted on the frame for manual closing. A pivoted platen lays substantially in its final closing position. The gate locks closed to the frame, and then a cam drives the platen into pressure engagement with the gate. The cam cycle turns off the drive and unlocks the gate.





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COLORING AND PRINTING EMBOSSED CARDS

BACKGROUND OF THE INVENTION

Unless a plastic sheet is used which is viscoelastic, letters and numbers embossed from the sheet are difficult to read. The viscoelastic materials are used extensively as ribbons for label making. Usually, such materials are not selected for use as printing members and identification cards. In such card use the embossment is colored in a separate step known as tipping.

A well-known and widely used machine for tipping of embossed plastic cards is illustrated and described in U.S. Pat. No. 2,973,853. In that description, a machine is provided for embossing large quantities of the cards and providing the tipping.

Not all establishments which issue embossed cards have need for large quantity of cards. Small establishments may issue so few that they emboss the cards manually. For users who cannot justify the equipment for producing large quantities, tipping is accomplished separately on a machine which accepts a single inserted card and then presses a ribbon against the card by means of a heated flat platen. The ribbon carries thermoplastic color which is caused to flow from the ribbon and to coat any compatible surface against which it has been pressed. U.S. Pat. No. 3,198,168 is an example of such a machine.

SUMMARY OF THE INVENTION

An advantage of this invention is that the person using the device can load an impression receiving card directly in position upon the member which ultimately carries the card into its impression forming position. There is no need for shuttle carrier devices, and the operator may know that the card is properly positioned before any machine function begins.

It is an object and advantage of this invention, to provide an impression forming device which is a type of printing press, wherein the member which carries the card and the member which presses a ribbon against the card, are widely separated for loading and closed manually to a close relationship, where printing can thereafter take place with a minimum of power drive equipment.

Another advantage of this invention is that a card may be tipped, printed, or both by installing selected platen faceplates having surface configurations which are planar, intaglio, or a combination.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective illustration of a fully jacketed commercial version of the preferred embodiment.

FIG. 2 is a diagrammatic side elevation in that all parts illustrated are proportional and properly located, but the frame and other structure have been eliminated for clarity of illustration.

FIG. 3 is a top view which is also skeletonized to aid in clarity of illustration.

FIG. 4 is a schematic illustration of a cycle control enabling the device to operate through one cycle only.

FIG. 5 illustrates a base platen with two types of exchangeable face members.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 of the drawings is a perspective view of the preferred embodiment of the invention encased in a housing 10 which covers over a main frame. It is usual to refer to the main body of such machine as a head. A platen 12 is mounted on the frame within housing 10 for pivotal advance and retract movement. A bed 14 is also pivotally mounted to the frame for advance and retract movement. The platen 12 and bed 14 are pivotally mounted for independent movement to and from a common abutment impression forming position. The construction and operation to bring about the meeting of these members in such common abutment impression forming position is best illustrated in FIGS. 2 and 3 of the drawings.

A ribbon 16 extends through the impression forming position to carry a supply of thermoplastic color material. A supply spool holder 17 and a takeup spool holder 18 provides for manual advance of the ribbon after each impression. By use of a ribbon as a color source web, storage and placement of individual sheets is unnecessary.

The FIGS. 2 and 3 are fragmentary structurally, having only those parts of the complete machine illustrated which are necessary to an understanding of invention, and eliminating structural details which are readily understood by those skilled in the art and which otherwise would cover and confuse parts necessary to the illustration. In FIG. 3, the main frame is indicated by the reference character 20, and two-side plates 21 of the main frame are shown. The sideplates 21 are eliminated entirely from the FIG. 2.

The member 14 is termed a bed for the reason that it serves the function, in the illustrated embodiment, of holding an impression receiving body. The bed 14 in this embodiment is pivotally mounted by a pivot rod 23 carried on the frame 20. FIG. 2 illustrates the two positions of the bed, the full lines illustrating the loading position and the dotted outline illustrating the work position. A card guide 24 is shown receiving an embossed card 25. Card 25 represents the most common impression receiving body. Portions of the card 25 may or may not have planar areas to be imprinted with surface markings which illustrate a message by script or other graphic art.

Although it may be acceptable to use either platen 12 or bed 14 to serve as a printing composition holder to hold a workpiece card as an impression receiving body, the bed 14 is preferable. Power wiring and mass consideration make reversal of this arrangement less attractive.

Bed 14 has a foot portion 27 on each of the lateral sides thereof. Each foot portion has a rounded forward end 28. Whenever the bed 14 is moved to work position, the foot 27 is engaged as a part of a releasable latching means for holding the bed in the impression forming position. The illustrated embodiment is a manual machine, and the bed is moved to the work position by the operator.

A yoke 30 is a U-shaped member which has spaced vertical sides and a joining bottom crossbar portion. A bar 33 bridges between the sides of the yoke. Swinging movement of the yoke causes a lateral swinging of the bar 33. A notch 34 in the forward end 28 of bed 14 is positioned to catch under bar 33 when the bed is closed. End 28 of foot 27 is a segment of a circle with its center on pivot rod 23. A roller 35, carried by a side member of yoke 30, is positioned to abut the end 28 as a cam follower. The bar 33 is carried by the same side member. The edge of bar 33 and a tangent to the surface of roller 35 are located on a circle segment equal to the segment of end 28 and on the same center 23. As the bed 14 moves in any position other than the fully closed position, the roller and edge of the bar will ride on end 28 and there will be no cam action. Yoke 30 will not move until notch 34 is moved to register with bar 33. In registration position of bar 33 and notch 34, roller 35 and end 28 are separated. Bar 33 will move into notch 34 and allow yoke 30 to swing under the urge of spring 36. Then, the latching is completed and the bed 14 is unable to return to the open position until the bar 33 is subsequently swung laterally to disengage the foot 27.

Bringing the bed 14 into the impression forming position as described, causes a switch device to activate a drive motor and carry through a complete cycle of operation, including an unlatching operation to free the bed 14. FIG. 4 together with FIG. 3 illustrates the cycle control feature.

A link 38 carried by the frame, is mounted to the yoke 30 on the shaft of the roller 35, and is moved along its longitudinal axis whenever the yoke 30 is caused to swing in producing the latching action. At the opposite end of the link 38 from roller 35 is a stub shaft 40. In FIG. 4, shaft 40 is reversed from its actual structure position for better teaching illustration. In its true position, it would be located behind link 38. A lever arm 42 is pivotally carried on sideplate 21. When yoke 30 moves forward under the urge of spring 36, stub shaft 40 will bear against the arm 42 and cause it to rotate about its pivot axis.

A switch 44 is carried on sideplate 21 in position to be actuated by the forward movement of arm 42. By means of known electrical circuitry, not illustrated, a motor 45 is energized by actuation of switch 44.

The motor 45 drives a gear reduction box 53 which in turn drives a rotary cam 55. The rotary cam is shown in FIGS. 2, 3 and 4. A link 57 is secured to a shaft 58 which extends vertically of the main frame. A link 59 is secured to the bottom end of the shaft 58. Hence, rotary movement of link 57 will induce a like movement and a like direction of the link 59. Link 59 extends through the frame and terminates adjacent a hook portion 60 on the bottom edge of link 38. Clockwise rotation of link 57, when viewed from the top as seen in FIG. 3, will cause a clockwise rotation of the link 59, and will induce a longitudinal movement of link 38 in the direction of the arrow to release the stub shaft 40 from the back of arm 42, and also pulls yoke 30 to move bar 33 out of notch 34 and unlatch the bed 14.

In order to produce the clockwise rotation of the link 57, the link is provided with a notch 62 as seen best in FIG. 3, but shown also in FIG. 4. A pin 64 carried by the rotary cam 55 is located in the notch 62 when in an inactive condition. As the pin 64 moves away from the link 57 at the beginning of the rotary drive, no drive force is imparted to the link, but thereafter the pin rotates around into engagement with a forward end 65 of the link. The link end 65 is positioned in the rotary path of the pin 64, and therefore must rotate out of that path in order to permit the pin 64 to continue. The pin 64 is power driven and is able to force the link aside. Such forcing aside causes a rotary drive of the link 57, resulting in the consequent unlatching function described. The pin 64 comes to rest in the notch 62 as the motor stops, and remains in that position until the motor is once again energized. The assembly of links 57 and 59 is urged counterclockwise by a spring 66.

A pivot frame 70 carries the platen 12 in its advance and retract movement. The platen may be attached by machine screws or equivalent structural elements, which are commonly known and understood by manufacturing people, and therefore are omitted from the drawing. A pivot rod 72 is bridged across the sideplates 21 to supply a pivotal mounting for the frame 70.

A follower wheel 74 is carried at the top of the pivot frame 70 in position to be engaged by the cam 55 as it rotates. The illustration of the cam 55 in FIG. 3 will reveal the land portion of the cam framed by the rapid ascent and rapid descent side portions. In the preferred embodiment, actual contact by the cam 55 against wheel 74 is confined almost exclusively to the land portion 75 and the forward movement of the platen 12 to apply a final work force is that movement caused by the slightly rounded nature of land portion 75 as seen in FIG. 3. Hence, in FIG. 2, although the forward advance of the platen has not been initiated, the platen is shown in light contact with the face of the bed 14. The advance by reason of the land area of the cam will compress the impression receiving card and ribbon. A spring 76 urges frame 70 to a retracted position primarily to prevent the frame from falling forward into an inoperative position, because the movement imparted by cam 55 is in the nature of a few thousandths of an inch, as indicated by the very slight curvature of cam land portion 75, resulting in a high-pressure short stroke squeeze.

The preferred embodiment is described as first and second members pivotally mounted on a base. Broadly, this preferred embodiment embraces two press parts which close through a long stroke in order to provide ample loading space. One of the parts is a matrix in the sense that it is a composite of one member in which another member is enclosed or carried. The other member, however, is advanceable with respect to its host carrier. The press parts are closeable and thereafter the carried member advances in a final power stroke.

The platen 12 is composed, in this preferred embodiment, of a heated block 78 mounted on the pivot frame 70. A channel 80 on the bottom of the block and a clip 82 at the top, ena-

bles the facile installation and removal of selective replaceable face elements. If the machine is to serve only a function of placing the coloring matter on the tips of embossment, the block 78 may be permanently faced with a resilient rectangular pad having a smooth surface. On the other hand, if the machine is to serve only the purpose of making a printing impression upon a flat surface impression receiving body, such as a plastic card, then a relief or raised letter plate may be permanently mounted on the block. According to the preferred embodiment of this invention, however, replaceable plates carry the type of impression to be made, and thus the machine is more versatile. To this end, a plate 84 is shown with a plate 85 secured on the surface thereof. Plate 85 has raised letters for the formation of intaglio impressions. A hook 86 is provided to engage into the clip 82, and a handle 88 provides a convenient means to grasp the plate for installation and removal from the face of the block.

A similar plate 89 is provided with a resilient planar base pad 90 for use in causing tip coloration only. The two members 84 and 89 are interchangeable and require only a short period of time to become sufficiently warm for proper heat transfer from the ribbon material.

Whereas the present invention has been shown and described herein in what is conceived to be the best mode contemplated, it is recognized that departures may be made therefrom within the scope of the invention which is therefore, not to be limited to the details disclosed herein, but is to be afforded the full scope of the invention as hereinafter claimed.

What I claim is:

1. An impression forming device, comprising:

a base;

first and second opposed members mounted on said base for independent movement to an impression forming position in abutting relation;

means adapting one of said members to carry an impression receiving body;

means adapting the other of said members to provide an impression producing surface;

a releasable latching means rendered effective on movement of one of said members to said impression forming position for holding said member in said position;

an energizable drive means operable to force the other member against the member latched in said impression forming position, and means to initiate said drive means effective only after said one member is in the abutting relation position, said drive means arranged to provide a predetermined interval in which said other member is forced against the latched member in said impression forming position, and means responsive to said energized drive means to release said latching means responsive to said drive means reaching a predetermined point in its operation.

2. An impression forming device as defined in claim 1, wherein said first and second opposed members comprise respectively a matrix means for supporting and transporting a receiving body and an abutment device with surface means for confronting the matrix means, and further characterized by the drive means being constructed and arranged to move said matrix and said abutment device between widely spaced loading and impression positions, and wherein said drive means is constructed and arranged for moving the matrix means in a high-pressure short stroke squeeze against said abutment device wherein said abutment position for applying a final work force.

3. In the impression forming device of claim 2, the matrix means and abutment device constituting a print couple movable together to transfer pigment material from a web positioned therebetween to a workpiece place therebetween.

4. An impression forming device as defined in claim 2, further characterized in that said means to release the latching means is operative only after completion of said short stroke squeeze.