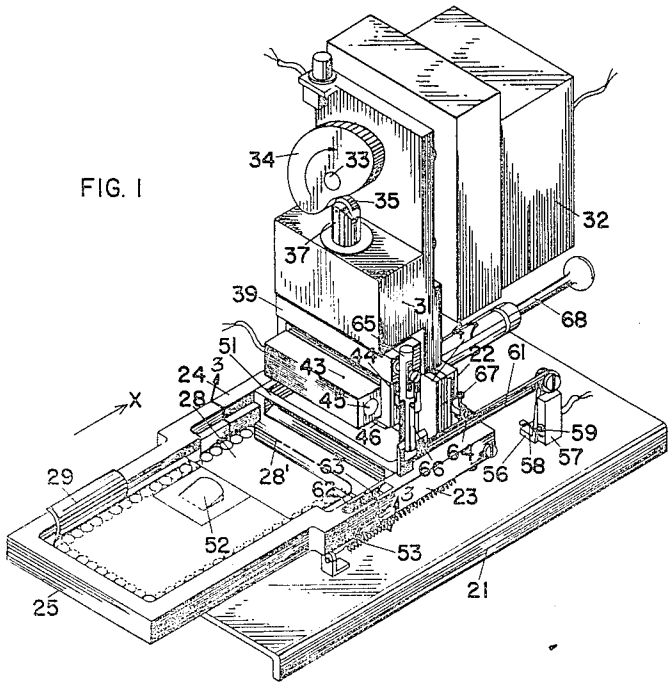
Dec. 9, 1969 YOW-JIUN HU 3,483,060

IDENTIFICATION CARD MECHANISM

Filed Nov. 4, 1965

FIG. 1



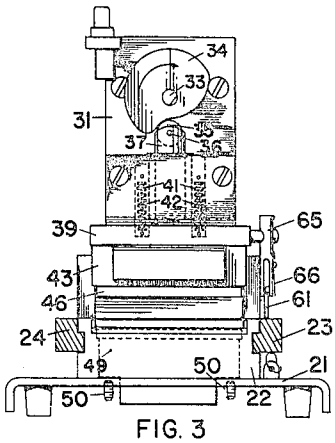


FIG. 3

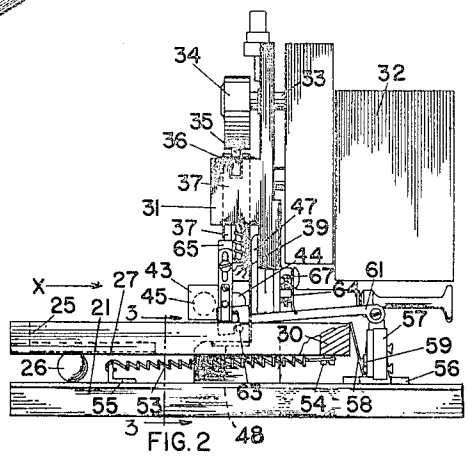


FIG. 2

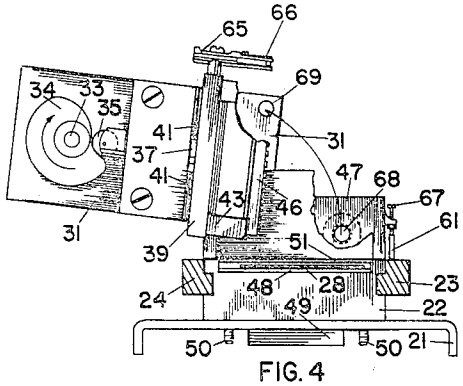


FIG. 4

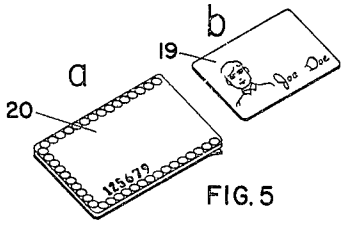


FIG. 5

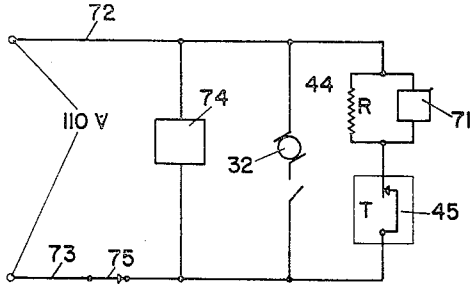


FIG. 6

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IDENTIFICATION CARD MECHANISM

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U.S. Cl. 156—368 7 Claims

The present invention relates to heat sealing and more specifically to apparatus for heat sealing plastic members used with identification cards or the like.

In many types of identification card systems, it is more expedient to manually assemble an identification card. One example of such a system would be in an instance where it is desired to issue a identification card at the point when information is obtained from the eventual user of the card. In many of such cases the user's picture may be taken and shortly thereafter inserted with other pertinent information within a plastic card receptacle which may have been pre-embossed for use with printing mechanisms that are well known in the art, such as that disclosed in U.S. Patent No. 2,620,729 to C. H. Gilbert issued Dec. 9, 1952. In employing such a system, it is further desired to provide apparatus for completely sealing the identification sheet within the plastic card receptacle to produce a complete identification card. The heat sealing operation must, however, be precise to match and adjoin the other pre-sealed edges of the card receptacle to provide a completely enclosed identification card to deter tampering. Further, too much or too little heat or pressure may not only result in a poorly sealed identification device, but also one that would present an unattractive appearance.

The general purpose of this invention is to provide such a new and improved heat sealing apparatus which, in the present embodiment, allows a fourth open side of a otherwise sealed plastic card receptacle containing an identification sheet to be readily fused in a pattern or configuration matching the pre-sealed portion of the receptacle. Briefly, the instant embodiment discloses a reciprocating tray for containing and aligning each of two adjacent sides of an identification card, which tray when manually actuated automatically initiates a complete heat sealing operation upon the leading edge of the identification card. Also provided is a replaceable die plate with raised patterns for transferring a similar pattern to the area sealed on the identification card.

Objects of the invention are to provide heat sealing apparatus which produces clean and uniform sealing between two plastic sheets, which operates conveniently and with little effort, which permits the heat sealing operation to automatically be initiated and completed for producing a high quality seal, which provides for two dimensional alignment of the identification card to be sealed, which provides for quick withdrawal of the identification card at the termination of the sealing operation, and in addition which allows for easy replacement and/or cleaning of die plates having various configurations with which to ensure adequate and attractive fusion.

Other objects, advantages and capabilities of the present invention will become apparent from the following detailed description, taken in conjunction with the accompanying drawings, illustrating a prefered embodiment of the invention.

In the drawings:

FIGURE 1 is a front perspective view of an heat sealing apparatus constructed in accordance with the principles of the present invention.

FIGURE 2 shows a side elevation of the heat apparatus shown in FIGURE 1 with the tray partly shown in section.

FIGURE 3 is a cross sectional view of the apparatus taken along line 3—3 of FIGURES 1 and 2.

FIGURE 4 shows a cross sectional view of the apparatus taken along line 3—3 of FIGURES 1 and 2, with the casting shown to be pivoted at about a right angle relative to the base.

FIGURE 5 is an isometric view of a plastic card receptacle and identification card with which the present invention may be used.

FIGURE 6 is an electric schematic diagram employed with the apparatus.

The apparatus, as illustrated in FIGURE 1, includes a pedestal **21** upon which is secured a base **22** having each of its sides channeled for receiving one of a pair of arms **23** and **24** adapted to support a tray **25** for reciprocal motion to and from the base by way of a path defined by the channeled sides. As disclosed in FIGURE 2, beneath the front on the tray is a roller **26**, preferably of steel, bounded between base **21** and an elongated groove **27** on the underside of tray **25** for a rolling, sliding motion. Tray **25** is recessed to accommodate a pocket type identification card **28** made of thermoplastic, and by way of a registration leaf spring **29**, to locate the card against one side of the tray for alignment with a die plate, to hereinafter be described. To prevent the tray from sliding off base **22**, a bar **30** connects the arms **23** and **24** at the rear of the device.

The specific identification card shown in FIGURE 5, comprises a photo identification chip **19** disclosing written or other information thereon, and a pair of transparent thermoplastic sheets **20** which are sealed together on three sides thereof to form a pocket for receiving the photo chip **19**. Once the photo chip has been properly recorded on and inserted in the pocket, the present device is employed to heat seal the fourth or open end **28'** for preventing one to readily tamper with the card. It is noted that one side of the card contains embossed characters adapting the card for use with printing mechanisms as is well known in the art.

Mounted upon base **22** is a casting **31**, and secured to the rear of the casting is a motor **32** having an output shaft **33** which shaft passes through the casting at its upper portion. Fixedly mounted to the end of the shaft for rotation therewith is an eccentric cam **34** adapted to bear against a bearing **35** pivotally connected through a pin **36** to the head of plunger **37** mounted for vertical sliding movement relative to shaft **33**. The plunger **37** telescopes downwardly and is secured to an insulation block **39**, to which block is also tied one of a pair of tension springs **41** parallel to and located at each side of the plunger, each tension spring **41** also being tied through one of a pair of elongated apertures **42** to a upper point within casting **31** for upwardly biasing the plunger.

Affixed to the lower side of insulation block **39** is a first die block **43** containing a heating assembly comprising a cylindrical shaped internal electrical resistance heating element **44** and a cylindrical shaped internal thermostat **45**. Attached to the bottom of the first die block by conventional means is a die plate **46** containing the particular configuration with which to seal two separate layers at the leading edge **28'** of thermoplastic card **28**. If desired, the configuration on the die plate may be made and used to be compatible with that employed to seal the other three edges of the card. To the rear of the die block and for aligning the same through a downward stroke during a heat sealing operation is a guide member **47** made from an insulating type material. Directly beneath die plate **46** is a bed plate **48** also of thermo insulating material for supporting the thermoplastic card during a sealing operation. The bed plate is secured to a second die block **49** seated within

base 22 and adapted to also contain a heating assembly when it is deseired to heat seal the leading edge of thermoplastic card 28 from the bottom up in which case bed plate 48 would be detached from the second die block 49 and secured to the first die block 43 and die plate 46 would be detaced from the first die block 43 and secured to the second die block 49. In those cases when the thickness of the identification card or die plate is greater or less than that conventionally used, or when it is desired to change the depth at which the die plate will penetrate the identification card, a pair of screws 50, shown in FIGURE 3, may be adjusted to obtain the desired result.

Slightly forward of the heat seal area adjacent die plate 46, is a bar 51 extending across the top of an area to be occupied by card 28 during a heat sealing operation, for preventing the leading edge of the thermoplastic card from being carried upward by adherence to the die plate. In those instances when card 28 is sealed from the bottom up by the heating assembly within second die block 49 it is necessary to urge the card upwardly and away from the die plate which function is served by a resilient leaf spring 52 positioned toward the inner edge of tray 28. It will also be observed that the tray is normally biased in an outward card receiving position as shown in FIGURE 1 due to the action of tray return tension spring 53 which is tied from a screw 54 secured at bar 30 to an extension member 55 affixed toward the front of pedestal 21.

To the rear of the apparatus is a bracket 56 supporting, for engagement with the horizontally moving arm 23 of tray 25, a snap-action switch 57 comprising pivoted lever 58 normally urged outwardly by a spring tensioned plunger 59, as illustrated in FIGURE 1. Subsequent to turning the apparatus on, the snap-action switch when actuated, by having lever 58 depress plunger 59 inwardly, will allow current to be supplied to motor 32 for driving output shaft 33. Mounted for pivotable movement about the bracket is a latch 61 having a front finger adapted to ride upon the upper surface of arm 23 and lock onto a roller pin catch 63 as the latch falls within an elongated cavity 62 formed in arm 23 to engage the tray for a heat sealing operation when the tray has been pushed in the direction as shown in FIGURE 2. A lightly biased spring 64 connected to base 22 serves to act downwardly upon latch 61 for urging and maintaining the latch in engagement with catch 63.

Situated directly above the latch and adjustably connected to a horizontal extension of insulation block 39 for vertical reciprocating movement therewith, is a clamp 65 including a ball and spring assembly 66 adapted to receive and raise the finger end of latch 61. In order to release the latch from clamp 65 for sliding motion relative to arm 23 an adjustable screw 67 is arranged above the top surface of the latch to prevent its further upward movement with the clamp and thus disengage latch 61 from the clamp.

At the back of base 22 is a spring biased pin 68 secured thereto for registration with a aperture 69 in casting 31, which casting is pivotable about base 22 as illustrated in FIGURE 4. By pulling the pin 68 rearwardly in the X direction and rocking the casting 31 about its pivot point, the die plate 46 may be readily replaced or cleaned, whichever is desired. Member 71 is merely an indicator light for informing the user when the apparatus has been switched on and that point in time when the heating element is at its proper heating temperature.

Referring now to FIGURE 6, there is shown a schematic of an exemplary electrical system which may be used with the present invention, wherein a conventional 110 volt AC source is fed to wires 72 and 73 across which is connected a indicator light 74 denoting when ON-OFF switch 75 is closed allowing current to be supplied to the apparatus. Also in parallel with wires 72 and 73 is motor 32 which is connected in series with snap-action switch 57. Further, it is noted that thermostat 45 is connected in series with heating element 44 thus acting as an open switch when the electrical resistance is at the proper heating temperature and to act as a closed switch when the electrical resistance is below the proper heating temperature. By hooking up indicator light 71 in parallel with heating element 44, one may readily observe whether the heating element is at the proper heating temperature.

The operation of the present invention may be best illustrated by first referring to FIGURE 1, wherein a view of the card receiving tray is disclosed in its initial position, displaced from the heat sealing station of the device. With the ON–OFF switch 75 closed as shown in FIGURE 6, the identification card 28 is first inserted into the tray to be urged against one side thereof by way of a registration leaf spring. When it is observed that heating element 44 is at the proper heating temperature for sealing the identification card, the tray is pushed inward until latch 61 falls within the groove 62 and connects with roller pin catch 63 to lock in the tray. At this point, card leading edge 28′ will be forced against the insulation guide member 47 since the length of the tray area when closed has been adjusted to be slightly shorter than the length of the identification card to be sealed, thus ensuring proper alignment of card leading edge 28′. The latter function may be easily accomplished by selective horizontal placement of bracket 56.

As the tray is locked into the aforesaid position, which is most clearly shown in FIGURE 2, lever 58 is pivoted to bear against the spring tensioned pluger 59 thereby closing snap-action switch 57 for supplying current to energize motor 32 for driving eccentric cam 34 via shaft 33. As the cam revolves the plunger 37 is urged downward against the force of tension spring 41 thereby driving down the die block and plate to bear upon the leading edge 28′ of the identification card fusing the two thermoplastic sheets by a pattern as determined by that particular configuration extending from the die plate. The dwell period of the plunger may be controlled by proper selection of the motor speed and the arc length of the maximum off-center radius of the eccentric cam whereat the die plate engages the identification card to be sealed.

Just prior to and during the dwell period the clamp 65 on insulation block 39 will engage the aperture at the finger area of latch 61 by way of the ball and spring assembly 66. As shaft 33 and eccentric cam 34 continue to rotate past the dwell period, the plunger will be returned by the force of tensioned springs 41 to the position shown in FIGURE 3. Therefore, initially the latch 61 will be lifted up by the clamp to release tray 25 allowing it to automatically and quickly return to its initial position by way of tension spring 53 enabling the fused area to freeze into a clearly defined pattern, and as a result of its action release snap-action switch 57 to cut off motor 32. Upward movement of the latch is halted by screw 67 thereby detaching the latch from the upwardly moving clamp and then biasing the latch on the top of the tray arm 23 as shown in FIGURE 1.

An important aspect of the present invention is the two dimensional alignment operation which properly seats the identification card during a heat sealing operation for properly locating the die plate pattern on leading edge 28′ of the card. Further, the opening left between the tray and the heat sealing station allows one to depress the card for easy removal of the card from within the tray as illustrated in FIGURE 1.

Another embodiment of the invention might provide for an immovable tray which is placed at a sharp vertical angle relative to the pedestal 21 allowing a card to be inserted therein and when aligned at its leading edge depress by some manner the snap-action switch for initiating a heat sealing operation.

It should be understood, of course, that the foregoing disclosure relates to only a preferred embodiment of the invention and that numerous modifications or alterations

may be made therein without departing from the spirit and the scope of the invention. It is desired, therefore, that only such limitations be placed on the invention as are imposed by the prior art and as set forth in the appended claims.

What is claimed is:

1. In apparatus for heat sealing identification cards and the like comprising a base, an area in said base defining a tray for receiving an identification card, means on said tray for aligning two adjacent edges of an identification card placed thereon, a supporting member attached to the base, a die block mounted on the supporting member above and adjacent one end of the tray, means for heating said die block, power means for driving the die block in cycles of reciprocation toward and away from the tray, switch means for activating said power means, and means for readily moving said supporting member for expeditious access to said die block, wherein said tray is mounted for reciprocating motion relative to the base and adapted to be manually urged from a card inserting position into a heat seal operating position, a bed on said tray for receiving an identification card to be heat sealed, said die block having a raised configuration thereon and provided to be mounted on said supporting member above and adjacent one end of the bed when the tray is in a heat seal operating position, said switch means responsive to the tray when urged into its heat sealed operating position, means for locking the tray when urged into its heat sealing position, means responsive to the return cycle of the die block for releasing said tray from the locking means, and means for urging said tray to its initial card inserting position when released from its locked position.

2. In apparatus for heat sealing identification cards and the like the combination recited in claim 1 including means on the bed for preventing an identification card to adhere to the die block immediately after the application of the heat seal thereto.

3. In apparatus for heat sealing identification cards and the like the combination recited in claim 1 wherein said tray is mounted for reciprocating motion relative to the base by way of a pair of guide rails, said alignment means comprising leafspring means for aligning two adjacent edges of an identification card placed on the bed during a heat seal operating position, a depression within said bed allowing for manual tilting of an identification card placed therein to readily remove the card from the apparatus, said supporting member being pivotably attached to the base, said power means comprising a drive shaft connected to a motor mounted on said supporting member, a off-centered cam secured to said drive shaft, a bearing driven by said cam, said bearing acting on the die block by way of a telescopic shaft, a pair of tension springs interposed between the die block and the supporting member to provide a yielding drive of the die block through said cam during its movement toward the bed through said springs to provide a dwell of the heated die block at the limit of its stroke toward the bed, said locking means comprising latch means for locking the tray when urged into its heat seal operating position, said releasing means comprising means adapted to reciprocate with the die block for lifting said latch to release the tray, means for releasing the latch from said tray for preventing an identification card to adhere to the die block at the termination of the dwell period.

4. In apparatus for heat sealing identification cards and the like comprising a base, a tray mounted for reciprocating motion relative to the base and adapted to be moved from a card inserting position to a heat seal operating position, a bed on said tray for receiving an identification card to be heat sealed, means on said bed for aligning a first edge of an identification card placed thereon, a supporting member mounted with respect to the base, a die block having a raised configuration thereon mounted on said supporting member above the adjacent one end of the bed when the tray is in said heat seal operating position, means for heating said die block, power means for reciprocably driving the die block toward and away from the bed, switch means for activating said power means, said switch means being responsive to the tray when urged into its heat sealed operating position, means for locking the tray when urged into its heat seal operating position, means for releasing said tray from the locking means when said die block is moved away from the bed, and means for urging said tray to its initial card inserting position after released from its locked position.

5. In apparatus for heat sealing identification cards and the like, the combination recited in claim 4 including means on said tray for preventing an identification card to adhere to the die block immediately after the application of the heat seal thereto.

6. In apparatus for heat sealing identification cards and the like, the combination recited in claim 4 including means for aligning a second edge of an identification card placed on said bed, said second edge being adjacent to said first edge.

7. In apparatus for heat sealing identification cards and the like, the combination recited in claim 4 including means for readily moving said supporting member for expeditious access to said die block.

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D. J. FRITSCH, Assistant Examiner

U.S. Cl. X.R.

100—93; 156—383, 539, 581, 583