This invention relates to a heat sealer. More particularly, it relates to a rotatable heat sealer for packages, especially cigarette packs, which contains a turnover device.

It is commercial practice to insert a cigarette pack in a wheel assembly of a wrapping machine, or packer as it is generally known. The wheel rotates 180° during the wrapping with cellophane and sealing of the edge seam, and the pack is ejected and proceeds along a conveyor belt. The open ends of the cellophane are folded as they move past stationary folders and are sealed as the wrapped pack passes between strip heaters. After sealing, the packs are manually packed in a carton.

As packed in the carton, the cellophane at the end of the pack folds upwardly. This is a distinct disadvantage when the cartons are slit by the jobbers who insert state stamps. Some of the cellophane becomes loosened and the moisture protection is destroyed. By inserting the pack upright in the carton, the top cellophane folds downwardly over the ends and much of the opening during the stamping operation is prevented. Thus, in order to position the packs properly in the carton, it is necessary to turn them 180° as they leave the conveyor belt.

With the commercial use of the pull package, i.e., a pack having a strip of tape bonded to the cellophane at the top of the pack which causes the pack to open upon the pulling of the tape, it was found that fixed strip heaters were inadequate to give a sufficient contact with the pack to securely seal the cellophane and the tape.

It is, therefore, the object of this invention to provide a rotatable heat sealer which will provide a constant pressure temperature and dwell time during heat sealing.

Another object of this invention is to provide a heat sealer by which a better seal is obtained in the cellophane to cellophane bond and a better heat seal between the pull tape and the cellophane in a pull package.

Another object of this invention is to provide a rotatable heat sealer with a turnover device which not only heat seals, but also turns the package over during the sealing.

A further object is to provide a rotatable heat sealer having an adjustable face which can be released from contact with the package so as to prevent heat damage to cellophane during momentary shutdown.

Another object will be apparent from the accompanying drawings and description.

Figure 1 is a top plan view of the apparatus forming the subject matter of the present invention.

Figure 2 is a side elevation thereof.

Figure 3 is a transverse sectional view through the sealing and rotary mechanisms.

Figure 4 is a side elevation of the releasing handle taken from the side opposite that shown in Figure 2.

Figure 5 is a plan view of the releasing mechanism.

Figure 6 is a sectional view taken on the line 6–6 of Figure 5.

Figure 7 is a sectional view taken on the line 7–7 of Figure 3.
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When unwrapped packages are passing through the heater or when the machine is stopped with wrapped packages in the rotary heater, means are provided to separate one end of the package from contact with the heating plates 18 and 19. Referring to Figures 1, 3, 4, 5 and 6, the means comprises a lever 65 having a handle portion 66 and an angular portion 67. The lever is attached to the bearing block 13 by a screw 68 but is free to rotate in bushing 69. The angular portion 67 is pivoted to the linkage 70 which in turn is pivoted to the set collar 71 by means of a set screw 72 which fastens the collar to the bearing 17. By manipulating lever 65 to the dotted line position shown in Figure 5, the linkage releases and spring 80 forces the bearing 17 to the right as viewed in Figure 3. The stationary heating plate 26 which is attached to the bearing 17 is also moved to the right along with heating plate 18 and set collar 21, thus separating end of the package 55 from heating plates 18.

In order to keep the faces of the hanger plates 18 and 19 clean, scraper blades 73 are mounted adjacent the ends of the rails 59 to bear against the heater plates while the plates are rotating. Referring to Figures 8, 9, 10, 11, each scraper blade is attached to its respective rail by one of bolts 74 with bushings 75 interposed between the blade and the rail. Pressure is supplied to the scraper blade by a garter spring 76 having its ends attached to the bolts 74 and having its center portion bearing against a pin 77 extending from the blade.

The operation of the device described above is as follows:

The wrapped packages with the unsealed and unfolded ends are removed from the rotating mechanism 51 by the pusher fingers 60 and advanced along the rails 59 passed wrapper folder 159 to the sealer where the packages are picked up in turret holder 45. The heating plates 18 and 19 are in sealing position as shown in Figure 3 and are spaced apart a sufficient distance to receive the packages and bear against the ends of the packages. The heated plates 18 and 19 and the turret holder rotate together through 180°, at which point the discharge paddles 53 move the package out of the sealer.

The rotation of the sealer with the package traveling 180°, results in the proper sealing of the package and turns the packages over into proper position to be received for packaging in a carton.

During the rotation of the sealer, the heater faces are scraped and cleaned by the scraper blades 73. If the wrapping machine is stopped with packages in the heat sealer, the heater plate 18 can be moved away from the package by rotation of lever 65 as previously pointed out.

Although I have shown and described a preferred embodiment of this invention, it is to be understood that modification may be made within the scope of the claims, without departing from the spirit or scope thereof. Such modifications, for example, as having the entire heating element rotate rather than the heater plates alone; eliminating heater opening device; and heat sealing only one surface of the package rather than the two surfaces shown. This can easily be accomplished by energizing only one of the stationary plates 25 or 26.

The preferred embodiment, however, which incorporates a rotating heater plate, has several advantages.

(1) It obviates the necessity for undesirable moving electrical contacts.

(2) Prevents disturbance of the cellophane folds since they move with the package.

(3) Permits continuous scraping of the plates to remove debris of adhesive, charred particles, etc.

The heater opening device which permits passage of unwrapped packages without activation of the pull-tape, while not essential, is highly advantageous.

I claim:

1. A heat sealer for packages comprising a rotary shaft mounted for rotation in a frame, a pair of spaced, heated rotatable elements affixed to said shaft and rotatable therewith, said elements adapted to heat seal a package positioned there between, one of said elements being movable along said shaft to vary the distance between said elements.

2. A heat sealer for packages comprising a rotary shaft mounted for rotation in a frame, a pair of spaced, heated rotatable elements affixed to said shaft and rotatable therewith, said elements adapted to heat seal a package positioned there between, a turnover holder having means thereon for receiving the packages to be sealed, said holder being keyed to said rotatable shaft for movement therewith and being positioned between the rotatable elements.

3. A heat sealer for packages comprising a rotary shaft mounted for rotation in a frame, a pair of spaced separator plates keyed to said shaft and rotatable therewith, said plates adapted to contact the opposite ends of a package positioned there between, and a pair of stationary heating bases in sliding contact with said separator plates.

4. A heat sealer for packages comprising a rotary shaft mounted for rotation in a frame, a pair of spaced separator plates keyed to said shaft and rotatable therewith, said plates adapted to contact the opposite ends of a package positioned there between, one of said plates being movable along said shaft to vary the distance between said plates, and a pair of stationary heating bases in sliding contact with said separator plates.

5. A heat sealer for packages comprising a rotary shaft mounted for rotation in a frame, a pair of spaced separator plates keyed to said shaft and rotatable therewith, said plates adapted to contact the opposite ends of a package positioned there between, one of said plates being movable along said shaft to vary the distance between said plates, and a pair of stationary heating bases in sliding contact with said separator plates.

6. A heat sealer for packages comprising a rotary shaft mounted for rotation in a frame, a pair of spaced separator plates keyed to said shaft and rotatable therewith, said plates adapted to contact the opposite ends of a package positioned there between, one of said plates being movable along said shaft to vary the distance between said plates, and a pair of stationary heating bases in sliding contact with said separator plates.

7. A heat sealer for packages comprising a rotary shaft mounted for rotation in a frame, a pair of spaced separator plates keyed to said shaft and rotatable therewith, said plates adapted to contact the opposite ends of a package positioned there between, a turnover holder having means thereon for receiving the packages to be sealed, said holder being keyed to said rotatable shaft for movement therewith and being positioned between the two separator plates, and a pair of stationary heating bases in sliding contact with said separator plates.

8. A heat sealer for packages comprising a rotary shaft mounted for rotation in a frame, a pair of spaced separator plates keyed to said shaft and rotatable therewith, said plates adapted to contact the opposite ends of a package positioned there between, a turnover holder having means thereon for receiving the packages to be sealed, said holder being keyed to said rotatable shaft for movement therewith and being positioned between the two separator plates, and a pair of stationary heating bases in sliding contact with said separator plates.

9. A heat sealer for packages comprising a rotary shaft mounted for rotation in a frame, a pair of spaced separator
plates keyed to said shaft and rotatable therewith, said plates adapted to contact the opposite ends of a package positioned there between, a turnover holder having means thereon for receiving the packages to be sealed, said holder being keyed to said rotatable shaft for movement therewith and being positioned between the two sealer plates, means mounted on the frame for advancing the packages to the turnover holder, and a pair of stationary heating bases in sliding contact with said sealer.

10. A heat sealer for packages comprising a rotary shaft mounted for rotation in a frame, a pair of spaced sealer plates keyed to said shaft and rotatable therewith, said plates adapted to contact the opposite ends of a package positioned there between, scrapers mounted on the frame contacting the faces of said sealer plates and a pair of stationary heating bases in sliding contact with said sealer plates.

11. A heat sealer for packages comprising a rotary shaft mounted for rotation in a frame, a pair of spaced sealer plates keyed to said shaft and rotatable therewith, said plates adapted to contact the opposite ends of a package positioned there between, one of said plates being movable along said shaft to vary the distance between said plates, a turnover holder having means thereon for receiving the packages to be sealed, said holder being keyed to said rotatable shaft for movement therewith and being positioned between the two sealer plates, said holder having spring means bearing against said holder and each of the plates, means mounted on the frame for advancing the packages to the turnover holder and a pair of stationary heating bases in sliding contact with said sealer plates.

12. A heat sealer for packages comprising a rotary shaft mounted for rotation in a frame, a pair of spaced sealer plates keyed to said shaft and rotatable therewith, said plates adapted to contact the opposite ends of a package positioned there between, one of said plates being movable along said shaft to vary the distance between said plates, a turnover holder having means thereon for receiving the packages to be sealed, said holder being keyed to said rotatable shaft for movement therewith and being positioned between the two sealer plates, said holder having spring means bearing against said holder and each of the plates, a pair of stationary heating bases in sliding contact with said sealer plates and one of said heating bases being adjustable with respect to the other of said bases.

13. A heat sealer for packages comprising a rotary shaft mounted for rotation in a frame, a pair of spaced sealer plates keyed to said shaft and rotatable therewith, said plates adapted to contact the opposite ends of a package positioned there between, one of said plates being movable along said shaft to vary the distance between said plates, a turnover holder having means thereon for receiving the packages to be sealed, said holder being keyed to said rotatable shaft for movement therewith and being positioned between the two sealer plates, said holder having spring means bearing against said holder and each of the plates, a pair of stationary heating bases in sliding contact with said sealer plates, one of said heating bases being adjustable with respect to the other of said bases and means operatively connected to said adjustable base for moving said base from said other base.

14. A heat sealer for packages comprising a rotary shaft mounted for rotation in a frame, a pair of spaced sealer plates keyed to said shaft and rotatable therewith, said plates adapted to contact the opposite ends of a package positioned there between, scrapers mounted on the frame contacting the faces of said sealer plates, one of said plates being movable along said shaft to vary the distance between said plates, a turnover holder having means thereon for receiving the packages to be sealed, said holder being keyed to said rotatable shaft for movement therewith and being positioned between the two sealer plates, said holder having spring means bearing against said holder and each of the plates, means mounted on the frame for advancing the packages to the turnover holder, a pair of stationary heating bases in sliding contact with said sealer plates, one of said heating bases being adjustable with respect to the other of said bases and means operatively connected to said adjustable base for moving said base from said other base.

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