

July 13, 1965 **H. B. KIMBALL ETAL** **3,194,098**
SEVERING APPARATUS HAVING TRANSFER MEANS OPERABLE TO ENGAGE
THE LEADING END OF THE WORKPIECE BEFORE SEVERANCE
Original Filed Sept. 29, 1959 3 Sheets-Sheet 1

3,194,098

3 Sheets-Sheet 1

FIG. 2.

TO CAM LEVER AND CAM

INVENTOR

HENRY B. KIMBALL
HENRY P. HASELL and
CLAIR M. RIVELY

BY *W. D. Palmer*
ATTORNEY

HENRY B. KIMBALL,
HENRY P. HASELL and
CLAIR M. RIVELY

BY *W. D. Palmer*
 ATTORNEY

July 13, 1965

H. B. KIMBALL ETAL

3,194,098

SEVERING APPARATUS HAVING TRANSFER MEANS OPERABLE TO ENGAGE
THE LEADING END OF THE WORKPIECE BEFORE SEVERANCE

Original Filed Sept. 29, 1959

3 Sheets-Sheet 2

FIG. 3.

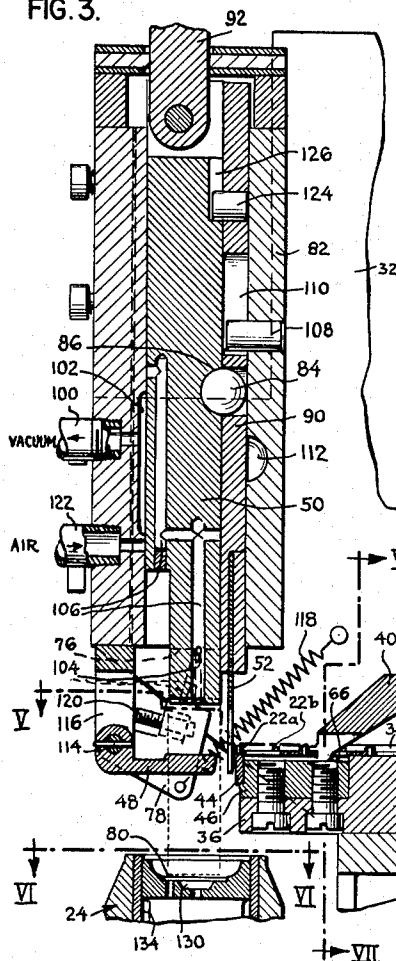


FIG. 4.

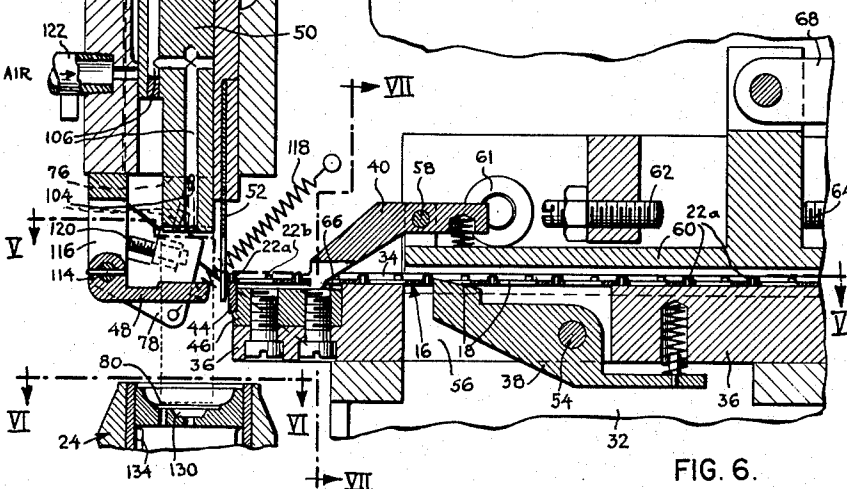
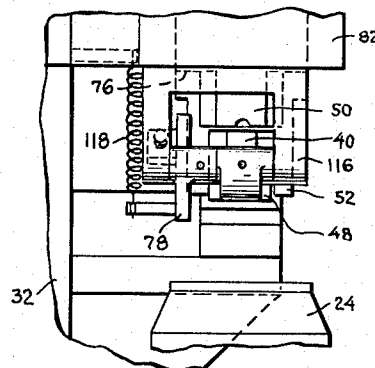
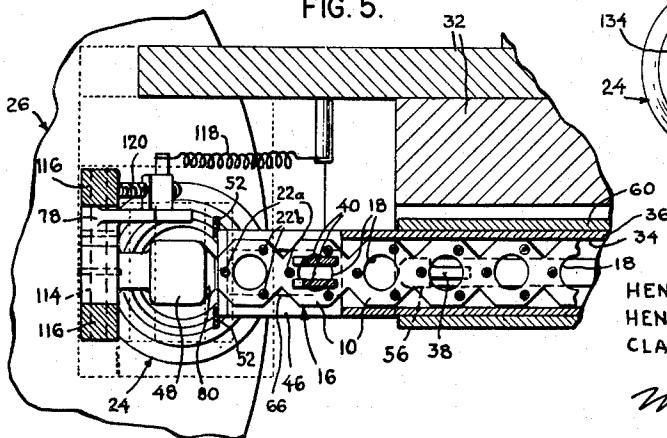
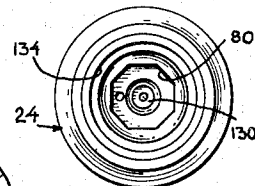


FIG. 5.

FIG. 6.



INVENTORS
HENRY B. KIMBALL,
HENRY P. HASELL and
CLAIR M. RIVELY.

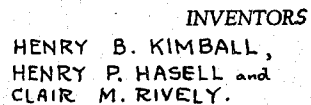
W.D. Palmer
ATTORNEY

H. B. KIMBALL ETAL

SEVERING APPARATUS HAVING TRANSFER MEANS OPERABLE TO ENGAGE
THE LEADING END OF THE WORKPIECE BEFORE SEVERANCE

Original Filed Sept. 29, 1959

3 Sheets-Sheet 3



W. D. Palmer
ATTORNEY

3,194,098

SEVERING APPARATUS HAVING TRANSFER MEANS OPERABLE TO ENGAGE THE LEADING END OF THE WORKPIECE BEFORE SEVERANCE

Henry B. Kimball, Mountain Lakes, Henry P. Hasell, Bloomfield, and Clair M. Rively, Rockaway, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa., a corporation of Pennsylvania

Continuation of application Ser. No. 843,277, Sept. 29, 1959. This application Nov. 8, 1962, Ser. No. 236,376 6 Claims. (Cl. 83—150)

This application is a continuation of application Serial No. 843,277, filed September 29, 1959, now abandoned, and owned by the present assignee.

The present invention relates to apparatus for feeding articles in a predetermined oriented position to an article-fabricating machine and, more particularly, to apparatus for feeding intermediate contacts to a base-making machine for the fabrication of bases for "Three-Lite" incandescent lamps.

Heretofore, the above-mentioned intermediate contacts were of the type shown in U.S. Patent No. 2,519,328, issued April 15, 1950, to J. B. Whitmore et al. These intermediate contacts were formerly fabricated in the form of a ring provided with a center opening. Upstanding from the periphery of this center opening, tapering curved and inclined lugs were provided for embedding in a glass insulator which insulates the center contact or eyelet from the intermediate contact. Embedding of the lugs in the glass insulator produced strains in the glass with resultant base shrinkage due to center eyelet crack-off thus causing the substitution of pronged hollow bosses for the lugs.

One of these pronged bosses is used as a substitute for an apertured frustoconical hollow boss previously provided in the patented intermediate contact, which pronged boss must be oriented in a predetermined position to receive a lead wire of the lamp. To provide the above-mentioned circular configuration these intermediate contacts are fabricated individually on a punch press from a strip which is wider than the diameter of the intermediate contact and the successive punchings are spaced a predetermined distance apart thereby resulting in considerable residual scrap in the strip from which they are punched.

The intermediate contacts are fed to a base-making machine of the type described in U.S. Patents Nos. 1,210,237 and 1,210,238, issued December 26, 1916, to T. I. Walker et al., by feeding apparatus of the type shown in U.S. Patent No. 2,519,328, issued August 15, 1950, to J. B. Whitmore et al. In such conventional feeding apparatus, the intermediate contacts are fed individually from a hopper along a slide into a pocket on a rotatable reservoir dial which indexes such intermediate contacts to a further work station where a first transfer means transfers these contacts to a turning head. A holding plunger in the turning head secures the intermediate contact while a rotating locating pin enters the lead-wire boss to orient such contact in the predetermined oriented position which it is to occupy in the bottom die of the base-making machine. Thereafter, a second transfer means transfers the oriented intermediate contact from the turning head into the bottom die.

The primary disadvantage of this conventional feeding apparatus is its inability to feed the intermediate contacts individually from the hopper into the pockets on the reservoir dial. The presence of the upstanding lugs or pronged bosses on the intermediate contacts and the relative resiliency and readily deformable nature of such intermediate contacts causes them to become commingled and entangled with the result that the feeding apparatus occasionally fails to feed an oriented intermediate contact to the base-making machine. Because of their fragility and small size, hand feeding of the oriented intermediate contacts onto the

pockets of the reservoir dial at a rate of 40 insertions per minute has been found to be inefficient.

This conventional feeding apparatus is also limited in its speed of operation by the minimum time required for its moving elements to perform their above-described tasks and hence is limited to production rates in the neighborhood of about 40 bases per minute. With the present trend in the industry toward higher production rates in the neighborhood of 65 bases per minute such conventional feeding apparatus has been found inadequate. In addition, the complexity of the apparatus and its many moving parts result in a high initial cost, considerable maintenance expense and resultant loss of production time.

It is the general object of the present invention to avoid and overcome the foregoing and other difficulties of and objections to prior-art practices by the provision of an improved apparatus for feeding articles in a predetermined oriented position to an article-fabricating machine, which feeding apparatus will operate efficiently at a high production rate.

Another object of the present invention is the provision of an improved feeding apparatus which will accept a continuous strip of articles disposed in a predetermined oriented position thereby eliminating the complicated and expensive article-orienting means heretofore employed.

Still another object of the present invention is the provision of an improved apparatus for feeding intermediate contacts to a base-making machine, which feeding apparatus is adapted to operate satisfactorily with a continuous strip of octagonal-shaped intermediate contacts thereby providing a 30% reduction in the scrap metal in the original strip by permitting the intermediate contacts to be punched from a strip of metal having the same width as the intermediate contact and by eliminating any web between adjacent punched intermediate contacts and also permitting such feeding apparatus to sever the intermediate contacts from the continuous strip with a single cut.

Yet another object of the present invention is the provision of an improved feeding apparatus which is adapted to receive a continuous strip of intermediate contacts thereby permitting the use of a positive feeding means and resulting in a higher equipment efficiency and a higher production rate.

A further object of the present invention is the provision of an improved feeding apparatus which is operable to receive an intermediate contact from a continuous strip of such intermediate contacts oriented in a predetermined position and to transfer an intermediate contact to the bottom die of a base-making machine where such intermediate contact because of its octagonal shape will remain locked in the oriented position.

The aforesaid objects of the present invention, and other objects which will become apparent as the description proceeds, are achieved by providing an improved apparatus for feeding articles to an article-fabricating machine, which feeding apparatus comprises means for presenting a continuous strip of such articles arranged in a predetermined position successively to a position adjacent a movable support where a transfer means secures the supported leading article and where a cutting means severs the supported and secured article from the strip thereby permitting the transfer means to deposit the article without further orientation into the article-fabricating machine.

For a better understanding of the present invention reference should be had to the accompanying drawings wherein like numerals of reference indicate similar parts throughout the several views and wherein:

FIG. 1 is a side-elevational view of the improved feeding apparatus of the present invention and the associated base-making machine and showing the transfer head, movable cutter, strip-advancing mechanism and the movable sup-

port in their starting positions at the beginning of the feeding cycle.

FIG. 2 is a plan view of the feeding apparatus and base-making machine shown in FIG. 1 with the upper portions of such feeding apparatus broken away for the sake of clarity.

FIG. 3 is an enlarged vertical-sectional view of the feeding apparatus and associated base-making machine taken along the line III—III of FIG. 2 in the direction of the arrows.

FIG. 4 is a fragmentary end view of the lower portions of the feeding apparatus taken from the left-hand side of FIG. 3 and showing the details of the movable support.

FIG. 5 is a horizontal-sectional view taken along the line V—V of FIG. 3 in the direction of the arrows.

FIG. 6 is a plan view of a head of the base-making machine taken along the line VI—VI of FIG. 3 in the direction of the arrows and showing the octagonal-shaped cavity in such head for receiving the oriented intermediate contact from the feeding apparatus of the present invention.

FIG. 7 is a fragmentary vertical-sectional view along the line VII—VII of FIG. 3 in the direction of the arrows and showing the advancing pawl in engagement with the continuous strip preparatory for the advancement of such strip.

FIG. 8 is a fragmentary vertical-sectional view similar to FIG. 3 and showing the leading intermediate contact on the continuous strip delivered onto the movable support by the advancing pawl; the transfer head moved downwardly to engage and secure such supported leading intermediate contact by vacuum means; the movable cutter, movable downwardly with such transfer head, after it has severed the secured and supported leading intermediate contact; and the operating cam associated with the movable support in engagement with a shoulder on the transfer head preparatory for movement of the movable support away from the path of movement of the transfer head.

FIG. 9 is a view similar to FIG. 8 and showing an intermediate position of the transfer head and the intermediate contact carried thereby and of the movable support during movement of the transfer head and the intermediate contact toward the head of the base-making machine and further showing the concurrent retraction of the advancing pawl.

FIG. 10 is a view similar to FIGS. 8 and 9 showing the delivery of the intermediate contact by the transfer head to the octagonal-shaped cavity in the head of the base-making machine and the release by the transfer head of such intermediate contact by the removal of the vacuum from such transfer head and the introduction of high-pressure air to such head.

FIG. 11 is a diagrammatic plan view of the base-making machine and illustrating its operation.

FIG. 12 is a fragmentary perspective view of a finished "Three-Lite" incandescent lamp to which the finished base is attached.

Although the principles of the present invention are broadly applicable to apparatus for feeding articles in a predetermined oriented position to an article-fabricating machine, the present invention is particularly adapted for use as apparatus for feeding intermediate contacts in a predetermined oriented position to a machine for fabricating bases for "Three-Lite" incandescent lamps and hence it has been so illustrated and will be so described.

With specific reference to the form of the present invention illustrated in the drawings, and referring particularly to FIGS. 1, 2 and 5, a continuous strip of octagonal-shaped intermediate contacts 10 (for use individually in a base 12, FIG. 12, for a "Three-Lite" incandescent lamp 14) is indicated generally by the reference numeral 16.

The intermediate contacts 10 are punched from the continuous strip 16 (which has the same width as the intermediate contacts 10) without a web between adjacent

intermediate contacts 10 thus permitting the feeding apparatus of the present invention to sever the intermediate contacts 10 from the continuous strip 16 with a single cut as hereinafter explained, resulting in a 30% reduction in the scrap metal produced in the fabrication of the prior art strip, and permitting the reeling of such continuous strip 16. The intermediate contacts 10 are joined end-to-end on the continuous strip 16 and are provided, as a result of a conventional punching operation (not shown), with a center opening 18 (FIGS. 2 and 5) which is to be filled with a glass insulator 20 (FIG. 12) and are provided with three pronged bosses 22a and 22b (FIG. 5) for embedding in the glass insulator 20. The pronged boss 22a is utilized for receiving a lead wire (not shown) of the lamp 14 and, as a result, must be fed to a head 24 (FIGS. 1-5 and 8-10) with such pronged boss 22a in a predetermined oriented position, the head 24 being disposed at station "1" (FIG. 11), the intermediate contact feeding station of a conventional base-making machine 26 (of the type shown in the above-mentioned U.S. Patent Nos. 1,210,237 and 1,210,238).

It will be understood from a consideration of FIGS. 2 and 5 that since the intermediate contacts 10 are joined end-to-end on the continuous strip 16, the lead-wire pronged bosses 22a in such intermediate contacts 10 are all arranged in a predetermined position with respect to each other, namely, on the left-hand portion of the intermediate contacts 10 in radial alignment with the center opening 18, thus permitting the use of a positive feeding means (as hereinafter explained) and eliminating the need for conventional complicated and expensive contact-orienting means as heretofore employed.

In order to load the continuous strip 16 of intermediate contacts 10 into the feeding apparatus of the present invention, the free end of such continuous strip 16 is passed over a guide roller 27, between a pair of guide rollers 28, FIGS. 1 and 2, and between a pair of drag rollers 29 of a conventional drag unit 30 mounted on the frame portions 32 of such feeding apparatus. This drag unit 30 is utilized in the conventional manner for braking the continuous strip 16 during the advancement thereof (as hereinafter explained) to prevent buckling of such continuous strip 16. Such free end is then inserted into a guide channel 34, FIG. 7, provided in the top face of a supporting block 36 (also secured to the frame portions 32) and is moved successively beyond a holding pawl 38 and an advancing pawl 40 of a strip-advancing mechanism 42 (FIG. 1) until the forward face of the leading intermediate contact 10 on such free end of the continuous strip 16 is positioned, as shown in FIGS. 1 and 2, in registry with a stationary cutter 44 (FIGS. 1, 3 and 8-10). This stationary cutter 44 is mounted on a removable adjustable block 46 secured to the forward end of the supporting block 36, which mounting of the removable block 46 permits adjustment and replacement of the stationary cutter 44.

This strip-advancing mechanism 42 is operable to advance the leading intermediate contact 10 a distance d_1 from the position shown in FIGS. 1 and 3 to the position shown in FIG. 8, in which position such leading intermediate contact 10 is supported by a movable support 48 and is oriented with respect to a transfer head 50 and a movable cutter 52 thereabove and a head 24 therebelow at station "1."

Strip-advancing mechanism

The holding pawl 38 associated with the strip-advancing mechanism 42 is pivoted on the supporting block 36 at 54 (FIGS. 1, 2 and 3) and is spring-biased in clockwise direction through an operating slot 56 provided in the supporting block 36 and into a center opening 18 in the fourth intermediate contact 10 disposed thereabove on the supporting block 36 and to engage the left-hand side, as shown in FIGS. 3, 5 and 10, of such center opening 18. To provide stop means for the clockwise urging of the spring biasing on the holding pawl 38, the right-hand

heel of such holding pawl 38 engages the underside of the fourth intermediate contact 10, as can be seen in FIGS. 3 and 10. The advancing pawl 40 is similarly pivoted at 58 (FIGS. 1, 3 and 8-10) on an operating slide 60 which is reciprocably movable by a reciprocating mechanism between the supporting block 36 (FIG. 7) and rollers 61 within the limits of adjustable stocks 62 and 64 upstanding from the frame portions 32. It will be appreciated from a consideration of FIGS. 1, 3 and 8 through 10 that such advancing pawl 40 is spring-biased in counterclockwise direction so that its operating end passes through the central opening 18 in the second intermediate contact 10 on the continuous strip 16 and engages the left-hand side of such central opening 18. Further, such operating end of the advancing pawl 40 is reciprocable in an operating slot 66 (FIG. 7) provided in the top face of the removable block 46 during operation of the reciprocating mechanism.

As shown particularly in FIG. 1, the strip-advancing mechanism 42 includes the reciprocating mechanism for the operating slide 60 and the advancing pawl 40 carried thereby which reciprocating mechanism comprises conventional linkage, such as a link 68 and a lever 70, for connecting such operating slide 60 to an operating piston 72 of a spring-biased one-way air cylinder 74. This air cylinder 74 may be operated at the desired time by a solenoid-actuated air valve (not shown), which air valve may in turn be actuated in the usual manner by closure of a normally-open switch operated by cam means on the main cam shaft of the base-making machine 26.

When high-pressure air flows into the air cylinder 74 the operating slide 60, the advancing pawl 40 and the continuous strip 16 are moved to the left, as viewed in FIGS. 1, 3, and 8 through 10, the aforesaid distance d_1 from the position shown in FIG. 1 to the position shown in FIG. 8, thus advancing the leading intermediate contact 10 onto the movable support 48 and into orientation with respect to the transfer head 50 and movable cutter 52 disposed thereabove and with the head 24 disposed therebeneath at station "1." During the strip-advancing operation the continuous strip 16 rides over the holding pawl 38, depressing such holding pawl slightly. The continuous strip 16 is thus advanced at a predetermined rate and with a stop-and-go motion.

Thereafter or during the latter portion of the strip-advancing operation, as desired, the transfer head 50 and the movable cutter 52 move downwardly from the position shown in FIGS. 1 and 3 to the position shown in FIG. 8. During this downward movement the transfer head 50 engages and secures by vacuum means such supported oriented leading intermediate contact 10 and thereafter the movable cutter 52 cooperates with the stationary cutter 44 (as a severing means) to sever the now secured and supported oriented leading intermediate contact 10. After the securing and severing operation, as shown in FIG. 8, a shoulder 76 on the transfer head 50 engages an operating cam 78 affixed to the movable support 48 preparatory for the movement of the movable support 48 out of the path of movement of the transfer head 50 and the intermediate contact 10 carried thereby toward the head 24. As a result of this securing and severing operation, the now severed, secured and supported oriented leading intermediate contact 10 remains in the predetermined oriented position without further orientation during the delivery of such severed intermediate contact 10 by the transfer head 50 into an octagonal-shaped cavity 80 (FIG. 6) in the head 24.

Transfer head

To permit the above-mentioned simultaneous vertical downward movement of the transfer head 50 and movable cutter 52, such transfer head 50 is slidably mounted in a housing 82, as viewed in FIGS. 1, 3 and 8-10, and is coupled to a slide 90 (which carries the movable cutter 52) by a ball 84 confined in a hemi-spherical aperture 86 in the transfer head 50 and in a longitudinal slot 88 in the

slide 90. This slide 90 is slidably mounted in the housing 82 between the wall thereof and the transfer head 50. It will be noted from FIGS. 8-10 that since the center of the ball 84 lies within the slot 88 and that since the ball 84 is pressed by the aperture 86 against the right-hand side wall of the slot 88, the ball 84 is adapted to leave the aperture 86 when a second hemi-spherical aperture 112 in the wall of housing 82 registers with the aperture 86 (FIG. 9) as hereinafter related.

The drive means (FIG. 1) utilized to cause the downward movement of the transfer head 50, the slide 90 connected thereto and the movable cutter 52 carried by the slide 90 comprises conventional linkage such as a first link 92, a lever 94, a second link 96 and a connecting rod 98, which connecting rod 98 is connected to a cam lever (not shown) driven by a cam on the main cam shaft of the base-making machine 26.

So that the transfer head 50 may secure the oriented leading intermediate contact 10 which is supported on the movable support 48 (before such leading intermediate contact is severed from the continuous strip 16 and when such transfer head 50 engages the leading intermediate contact 10) a vacuum line 100 extends through the side wall of the housing 82 (FIGS. 1, 3 and 8-10) to a vacuum manifold 102 provided in the inner side wall of such housing 82. Such vacuum line 100 then communicates with a plurality of apertures 104 (only one of which is shown in FIGS. 1, 3 and 8-10) through a port 106 which interconnects the vacuum manifold 102 and the apertures 104 extending to the lower contact face of the transfer head 50.

As the transfer head 50 is moved downwardly from the position shown in FIGS. 1 and 3 to the position shown in FIG. 8 (but before such transfer head 50 engages the leading intermediate contact 10) the port 106 is exposed to the vacuum manifold 102, thereby applying a vacuum to the apertures 104 and drawing the pronged boss 22a and 22b into the clearance slots 105 in the bottom face of the transfer head to maintain orientation before such transfer head applies pressure on the leading intermediate contact 10. Immediately thereafter the movable cutter 52 severs the leading intermediate contact 10 and the transfer head 50 holds the severed intermediate contact 10 (FIG. 8) in oriented position against the movable support 48.

The transfer head 50, the severed intermediate contact 10 carried thereby and the slide 90 connected thereto then continue downwardly from the position shown in FIG. 8 to the position shown in FIG. 9, where the slide 90 engages a stop 108 (projecting from the housing 82 into a slot 110 in the slide 90) thus terminating the downward movement of the slide 90 and the movable cutter 52 carried thereby. When the slide 90 ceases its downward movement the hemi-spherical apertures 86 and 112 are in registry so that any infinitesimal further downward movement of the transfer head 50 with respect to the slide 90 forces the ball 84 to move to the right (FIG. 9) out of the hemi-spherical aperture 86, across the slot 88 and into the second hemi-spherical aperture 112 in the housing 82, thus coupling the slide 90 to the housing 82 and permitting the continued downward movement of the transfer head 50 and the intermediate contact 10 carried thereby to the position shown in FIG. 10.

During the downward movement of the transfer head 50 and the movable cutter 52 from the position shown in FIG. 8 to the position shown in FIG. 9, the operating slide 60 and the advancing pawl 40 are retracted to the right (the aforesaid distance d_1) so that such advancing pawl 40 slides out of engagement with the now leading intermediate contact 10 on the continuous strip 16 and into engagement with the now second intermediate contact 10. Because of the engagement of the holding pawl 38 with the continuous strip 16, the continuous strip 16 remains stationary with respect to the supporting block

36 during this retracting movement of the operating slide 60 and the advancing pawl 40.

Simultaneously, as the transfer head 50 moves from the position shown in FIG. 8 to the position shown in FIG. 9, such transfer head 50 begins to move the movable support 48 away from its downward path of movement toward the head 24, as now described.

Movable support

This movable support 48 and the operating cam 78 associated therewith are affixed to a shaft 114 (FIGS. 1, 3 and 8-10) journaled in a bracket 116 depending from the lower portions of the housing 82. Such movable support 48 and the operating cam 78 are biased upwardly in counterclockwise direction to the normal contact-supporting position of the movable support 48 by a spring 118 (FIGS. 1 and 3) as determined and limited by an adjustable stop 120 projecting from the operating cam 78 and engaging the bracket 116.

It will be apparent from a consideration of FIGS. 8 through 10 that as the transfer head 50 moves downwardly from the position shown in FIG. 8 to the position shown in FIG. 10, the shoulder 76 on such transfer head 50 exerts a downward force on the operating cam 78 to move both the operating cam 78 and the movable support 48 in clockwise direction (against the action of the spring 118) out of the path of downward movement of the transfer head and the intermediate contact 10 carried thereby toward the octagonal-shaped cavity 80 in the head 24.

To provide means for releasing the intermediate contact 10 from the transfer head 80 when it is deposited in the octagonal-shaped cavity 80, the port 106 in the transfer head 50 moves out of communication with the vacuum manifold 102 (FIGS. 8-10) and into communication with a high-pressure air line 122 extending through the side wall of the housing 82. This high-pressure air causes attendant elimination of the vacuum within the port 106 and permits the intermediate contact 10 to remain in the octagonal-shaped cavity 80 when the transfer head 50 is retracted from its position shown in FIG. 10 to the position shown in FIGS. 1 and 3. Because of the similar octagonal-shape of both the intermediate contact 10 and the cavity 80, such contact 10 remains locked in the predetermined oriented position with the lead-wire boss 22a on the left, as viewed in FIGS. 1 and 3, without further orientation.

When the transfer head 50 arrives at the intermediate position shown in FIG. 9 during this retracting movement, the hemi-spherical aperture 86 again moves into registry with the hemi-spherical aperture 112, as shown in FIGS. 1 and 3. Simultaneously therewith a pin 124 (projecting from the slide 90 into a longitudinal slot 126 in the right-hand side wall of the transfer head 50) is engaged by the bottom of such slot 126 so that thereafter both the slide 90 and the transfer head 50 are coupled together. Any further infinitesimal upward movement of the now coupled slide 90 and the transfer head 50 forces the ball 84 to move to the left across the slot 88 and into the hemi-spherical aperture 86 to uncouple the slide 90 from the housing 82, thus permitting the slide 90 and the transfer head 50 to thereafter retract upwardly together to the starting position shown in FIGS. 1 and 3, preparatory for the next contact-feeding operation and for the indexing of the now loaded head 24 out of station "1" (FIG. 1).

Thereafter the head 24 indexes to station "4" (FIG. 11) where a center contact 128 (FIG. 12) is fed into an eyelet pocket 130 (FIG. 6) in the head 24 and thence to station "8" where a shell 132 (FIG. 12) is positioned in a shell-receiving aperture 134 (FIG. 6) in the head 24. At station "14" a predetermined gob of molten glass is fed to the head 24 and molded at stations "15" and "16" into the glass insulator 20 shown in FIG. 12.

A pair of plungers (not shown) are utilized at station "20" to maintain the openings through the hollow lead-wire pronged boss 22a and center contact 128 so that upon completion of the base 12, lead wires (not shown) may be passed therethrough.

In the conventional manner the finished base 12 is then assembled to an exhausted "Three-Lite" incandescent lamp 14 to provide the finished lamp shown in FIG. 12.

It will be recognized by those skilled in the art that the objects of the present invention have been achieved by providing an improved apparatus for feeding articles in a predetermined oriented position to an article-fabricating machine. Such improved feeding apparatus will operate efficiently at a high production rate and is adapted to receive a continuous strip of articles disposed in a predetermined oriented position thereby eliminating the need of conventional complicated and expensive article-orienting means heretofore employed.

Specifically, the utilization of a continuous strip of octagonal-shaped intermediate contacts provides a 30% reduction in the scrap metal in the original strip by permitting the intermediate contacts to be punched from a strip of metal having the same width as the intermediate contact and by eliminating any web between adjacent punched intermediate contacts. This elimination of the web permits the improved feeding apparatus to sever the intermediate contacts from the continuous strip with a single cut. Further, the use of the continuous strip of intermediate contacts in the improved feeding apparatus permits the use of a positive feeding means thereby resulting in higher equipment efficiency and a higher production rate. Such improved feeding apparatus receives the intermediate contact in a predetermined oriented position and transfers individual intermediate contacts to the bottom die of a base-making machine where such intermediate contact, because of its octagonal-shaped will remain locked in the oriented position.

While in accordance with the patent statutes one best known embodiment of the present invention has been illustrated and described in detail, it is to be particularly understood that the invention is not limited thereto or thereby.

We claim as our invention:

1. Apparatus for feeding articles to a fabricating machine, the articles being presented to said apparatus as a continuous strip comprising such articles connected to each other, and said continuous strip entirely spaced from said fabricating machine, said apparatus comprising,
 - (a) continuous strip guiding and feeding means having a delivery end and operable to guide and feed articles comprising said continuous strip toward and past such delivery end at a predetermined rate and with a stop-and-go motion,
 - (b) movable support means positioned proximate to said delivery end and operable to support the leading article of said continuous strip when such leading article is moved by said feeding means past said delivery end,
 - (c) transfer means having vacuum-producing means connected thereto and operable first to move to a position proximate to said movable support means to retain by suction the leading article of said continuous strip as supported on said movable support means,
 - (d) severing means movable to position adjacent to said delivery end to sever from said continuous strip the leading article as retained by said transfer means,
 - (e) said transfer means then operable to move toward said fabricating machine first to force said movable support means from its path of movement and then to deliver in proper orientation with respect to said fabricating machine the now-severed article, and
 - (f) actuating means for actuating in the foregoing

work sequence said guiding and feeding means, said transfer means, and said severing means.

2. Apparatus for feeding individual properly oriented articles to a fabricating machine, the articles being presented to said apparatus as a continuous strip comprising such articles connected to each other and disposed in the same direction, and said continuous strip entirely spaced from said fabricating machine, said apparatus comprising:

- (a) continuous strip guiding and feeding means having a delivery end, said continuous strip guiding and feeding means operable to guide and feed articles comprising said continuous strip toward and past said delivery end at a predetermined rate and with a stop-and-go motion;
- (b) movable support means positioned proximate to said delivery end, said movable support means operable to support the leading article of said continuous strip when such leading article is moved by said feeding means past said delivery end;
- (c) transfer means having article-retaining means connected thereto and operable first to move to a position proximate to said movable support means, said transfer means when moved to position proximate to said movable support means operable to retain the leading article of said continuous strip as supported on said movable support means;
- (d) severing means movable to position adjacent to said delivery end, said severing means upon being moved to position adjacent to said delivery end operable to sever from said continuous strip the leading article as retained by said transfer means;
- (e) said transfer means then operable to move toward said fabricating machine first to force said movable support means from its path of movement and then to deliver in proper orientation with respect to said fabricating machine the now-severed article; and
- (f) actuating means for actuating in the foregoing work sequence said guiding and feeding means, said transfer means, and said severing means.

3. Apparatus for feeding individual properly oriented articles to a fabricating machine, the articles being presented to said apparatus as a continuous strip comprising such articles all connected to each other and disposed in the same direction, and said continuous strip entirely spaced from said fabricating machine, said apparatus comprising:

- (a) continuous strip guiding and feeding means having a delivery end, said continuous strip guiding and feeding means operable to guide and feed articles comprising said continuous strip toward and past said delivery end at a predetermined rate and with a stop-and-go motion;
- (b) movable support means positioned proximate to said delivery end and along the path of said continuous strip after it is moved past said delivery end, said movable support means operable to support the leading article of said continuous strip after such leading article is moved by said feeding means past said delivery end;
- (c) transfer means having vacuum producing means connected thereto and operable first to move from a rest position to a position proximate to said movable support means, said transfer means when moved to position proximate to said movable support means operable to retain by suction the leading article of said continuous strip as supported on said movable support means;
- (d) severing means movable to position adjacent to said delivery end to form with said delivery end a strip severing mechanism, said severing means upon being moved to position adjacent to said delivery end operable to sever from said continuous strip the leading article as retained by said transfer means;
- (e) said transfer means then operable to move toward

said fabricating machine while retaining the severed article first to force said movable support means from its path of movement and then to deliver in proper orientation with respect to said fabricating machine the severed article; and

- (f) actuating means for actuating in the foregoing work sequence said guiding and feeding means, said transfer means, and said severing means.

4. Apparatus for feeding individual properly oriented articles to a fabricating machine, the articles being presented to said apparatus as a continuous strip comprising such articles all connected to each other and disposed in the same direction, said apparatus comprising:

- (a) continuous strip guiding and feeding means having a delivery end, said continuous strip guiding and feeding means operable to guide and feed articles comprising said continuous strip toward and past said delivery end at a predetermined rate and with a stop-and-go motion;
- (b) movable support means positioned proximate to said delivery end and along the path of said continuous strip after it is moved past said delivery end, said movable support means operable to support the leading article of said continuous strip after such leading article is moved by said feeding means past said delivery end;
- (c) transfer means operable first to move to a position proximate to said movable support means, said transfer means comprising a slide having an end portion adapted to be moved into contacting relationship with the leading article of said continuous strip as supported by said movable support means, an aperture provided through said slide and opening into (1) said end portion of said slide and (2) an intermediate portion of said slide;
- (d) vacuum-producing means and air-pressure-supply means provided proximate to intermediate portions of said slide, said vacuum-producing means connecting to the aperture provided in said slide when said end portion of said slide is moved into contacting relationship with the leading article of said continuous strip in order to retain by suction such leading article of said continuous strip;
- (e) severing means movable to position adjacent to said delivery end of said guiding and feeding means to form with said delivery end a strip-severing mechanism, said severing means upon being moved to position adjacent to said delivery end being operable to sever from said continuous strip the leading article of said strip as retained by said transfer means;
- (f) ball-coupling means operable to couple together and to release from coupled position said transfer means and said severing means, said ball-coupling means operable to couple together said transfer means and said severing means until said severing means has severed from said continuous strip the leading article thereof as retained by said transfer means, thereafter said ball-coupling means acting to disconnect said transfer means and said severing means;
- (g) said transfer means then operable to move toward said fabricating machine while retaining by vacuum suction the severed article first to force said movable support means from its path of movement and then to place in predetermined orientation proximate to said fabricating machine the retained article previously severed from said continuous strip, thereafter said air-pressure-supply means connecting to the aperture provided in said slide of said transfer means to release from said transfer means and to said fabricating machine the severed and transferred article; and
- (h) actuating means for actuating in the foregoing work sequence the components comprising said apparatus.

5. Apparatus for feeding individual properly oriented base contacts to a lamp base fabricating machine, the base

contacts being presented to said apparatus as a continuous strip comprising such base contacts all connected to each other and disposed in the same direction, said apparatus comprising:

- (a) continuous strip guiding and feeding means having a delivery end, said continuous strip guiding and feeding means operable to guide and feed connected base contacts comprising said continuous strip toward and past said delivery end at a predetermined rate and with a stop-and-go motion;
- (b) movable support means positioned proximate to said delivery end and along the path of said continuous strip after it is moved past said delivery end, said movable support means operable to support the leading base contact of said continuous strip after such base contact is moved by said feeding means past said delivery end;
- (c) transfer means operable first to move to a position proximate to said movable support means, said transfer means comprising a slide having an end portion adapted to be moved into contacting relationship with the leading base contact of said continuous strip as supported by said movable support means, an aperture provided through said slide and opening into (1) said end portion of said slide and (2) an intermediate portion of said slide;
- (d) vacuum-producing means and air-pressure-supply means provided proximate to intermediate portions of said slide, said vacuum-producing means connecting to the aperture provided in said slide when said end portion of said slide is moved into contacting relationship with the leading base contact of said continuous strip in order to retain by suction such leading base contact of said continuous strip;
- (e) severing means movable to position adjacent to said delivery end of said guiding and feeding means to form with said delivery end a strip-severing mechanism, said severing means upon being moved to position adjacent to said delivery end being operable to sever from said continuous strip the leading base contact of said strip as retained by said transfer means;
- (f) ball-coupling means operable to couple together and to release from coupled position said transfer means and said severing means;
- (g) stop means positioned in the path of movement of said severing means to stop further movement of said severing means after said severing means has operated to sever from said continuous strip the leading base contact thereof, after said severing means is stopped from further movement by said stop means said ball-coupling means operating to disconnect said transfer means and said severing means;
- (h) said transfer means then operable to move toward said fabricating machine while retaining by vacuum suction the severed base contact first to force said movable support means from its path of movement and then to place in predetermined orientation proximate to said lamp base fabricating machine the retained base contact previously severed from said continuous strip, thereafter said air-pressure-supply means connecting to the aperture provided in said slide of said transfer means to release from said transfer means and to said lamp base fabricating machine the severed and transferred base contact; and
- (i) actuating means for actuating in the foregoing work sequence the components comprising said apparatus.

6. Apparatus for feeding individual properly oriented articles to a fabricating machine, the articles being presented to said apparatus as a continuous strip comprising such articles all connected to each other and disposed in the same direction, and said continuous strip entirely spaced from said fabricating machine, said apparatus comprising:

- (a) continuous strip guiding and feeding means having a delivery end, said continuous strip guiding and feeding means operable to guide and feed articles comprising said continuous strip toward and past said delivery end at a predetermined rate and with a stop-and-go motion;
- (b) movable support means positioned proximate to said delivery end and along the path of said continuous strip after it is moved past said delivery end, said movable support means operable to support the leading article of said continuous strip after such leading article is moved by said feeding means past said delivery end;
- (c) transfer means operable first to move to a position proximate to said movable support means and in contacting relationship with the leading article of said continuous strip;
- (d) vacuum-producing means and air-pressure-supply means connected to said transfer means, said vacuum-producing means actuated when said transfer means is moved into contacting relationship with the leading article of said continuous strip to cause said transfer means to retain by suction such leading article of said continuous strip;
- (e) severing means movable to position adjacent to said delivery end of said guiding and feeding means to form with said delivery end a strip-severing mechanism, said severing means upon being moved to position adjacent to said delivery end being operable to sever from said continuous strip the leading article of said strip as retained by said transfer means;
- (f) said transfer means then operable to move toward said fabricating machine while retaining by vacuum suction the severed article first to force said movable support means from its path of movement and then to place in predetermined orientation proximate to said fabricating machine the retained article previously severed from said continuous strip, thereafter said air-pressure-supply means actuated to relieve the suction between said transfer means and the severed and transferred article to release from said transfer means and to said fabricating machine the severed and transferred article; and
- (h) actuating means for actuating in the foregoing work sequence the components comprising said apparatus.

References Cited by the Examiner

UNITED STATES PATENTS

1,011,630	12/11	Lassen	53—297
1,861,099	5/32	Smith	83—571
2,308,086	1/43	Landrock	83—157
2,405,074	7/46	Underwood	53—297 X
2,603,291	7/52	Williams	83—157
2,618,334	11/52	Cobb	83—100 X
2,831,584	4/58	Cundall	83—154
2,941,341	6/60	Clinton	83—100 X

ANDREW R. JUHASZ, *Primary Examiner*.