United States Patent [19]

Ruskin

[11] **3,837,456**

[45] **Sept. 24, 1974**

[54] **EMBOSSING TOOL**

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[73] Assignee: **Swingline, Inc.,** Long Island City, N.Y.

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[21] Appl. No.: **320,657**

[52] **U.S. Cl.** **197/6.7,** 197/188, 101/18

[51] **Int. Cl.** **B41j 1/24**

[58] **Field of Search** 197/6.7, 187, 188; 101/18

[56] **References Cited**

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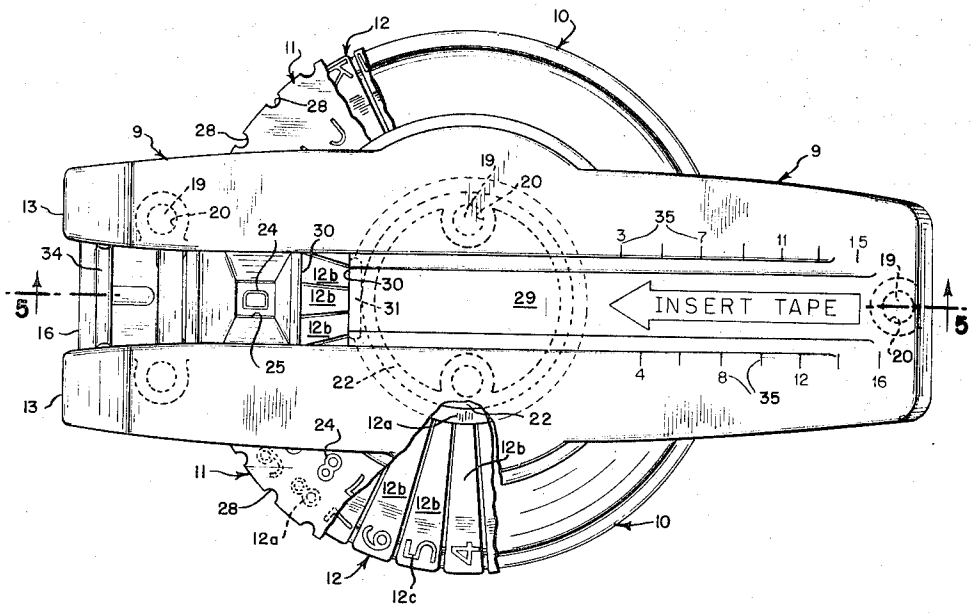
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Attorney, Agent, or Firm—Pennie, Edmonds, Morton, Taylor & Adams

[57] **ABSTRACT**

An embossing tool for tape strip labels comprises a single-piece plastic extrusion capable, upon being folded clam-wise, of forming two halves of the tool housing and an integral embossing lever, and two mating embossing discs mounted in the housing for embossing a strip of plastic tape fed between the discs along the radii thereof.

11 Claims, 5 Drawing Figures



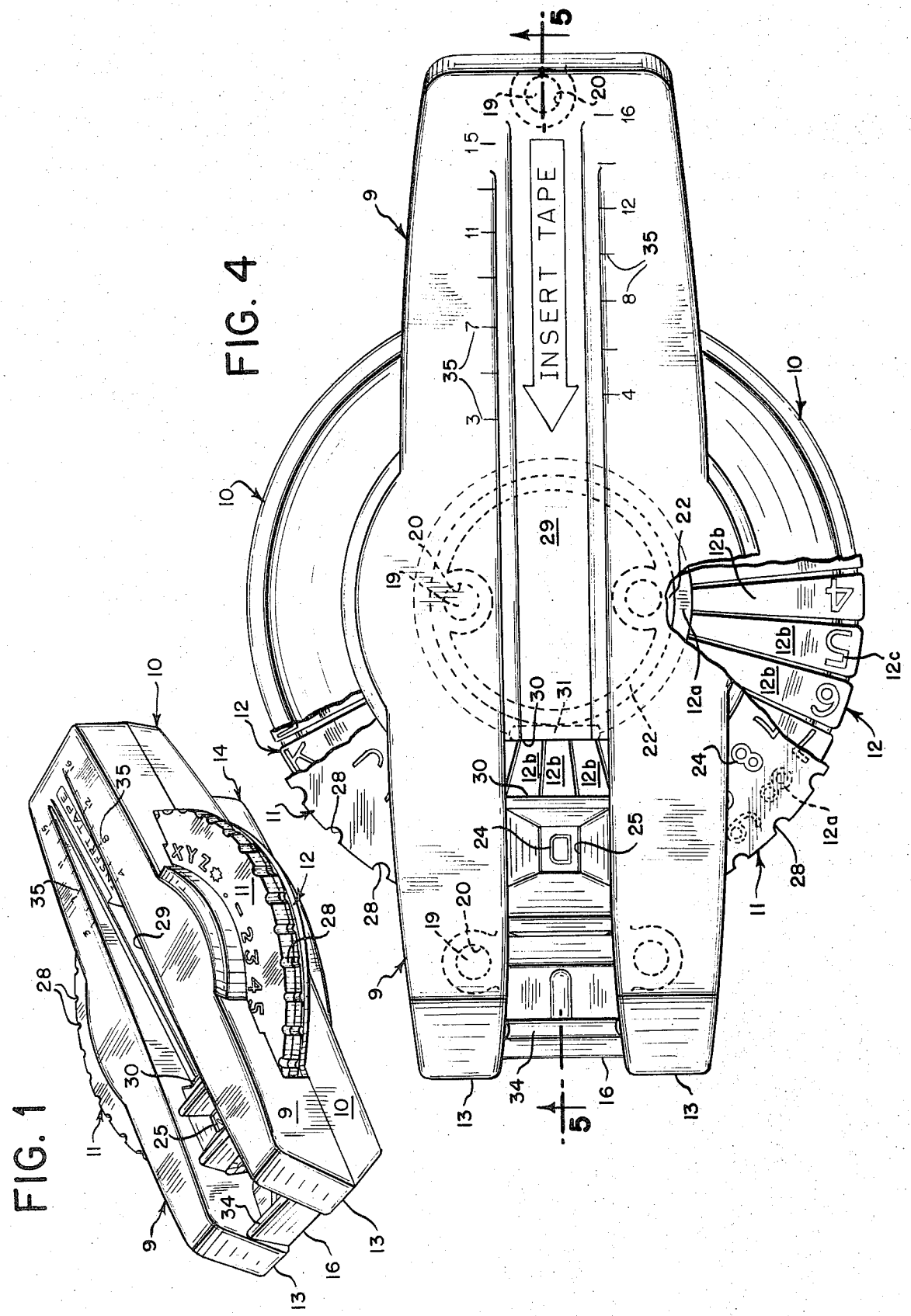

INSERT TAPE
FIG. 4
FIG. 1

FIG. 2

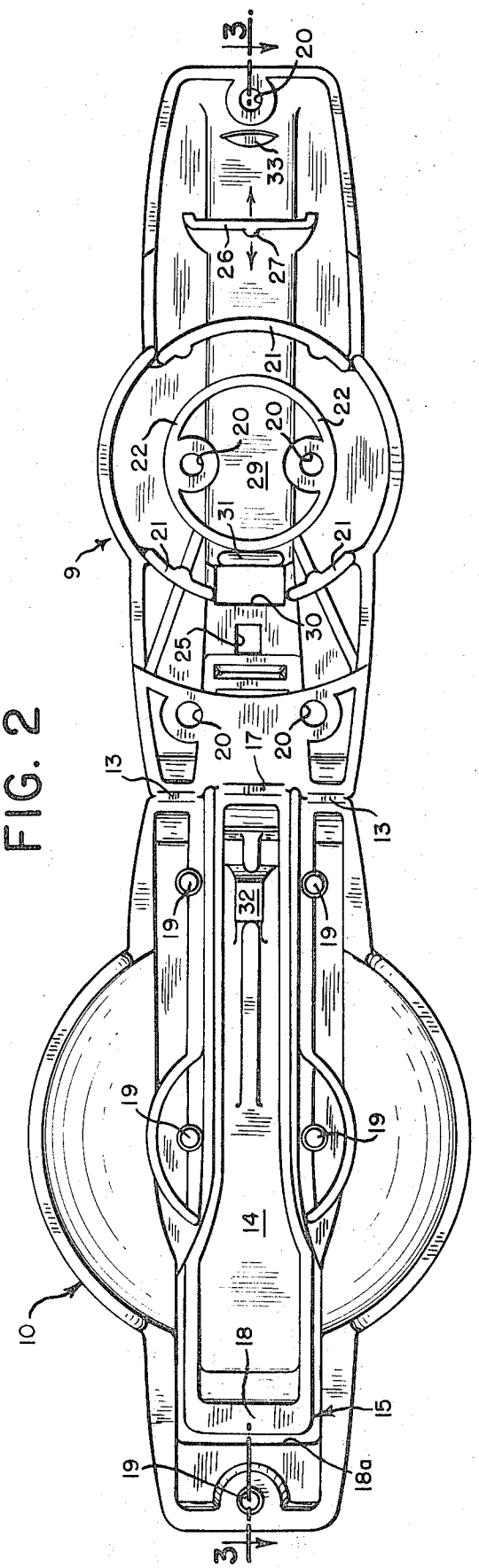

13
20
33
26
27
21
22
29
31
30
25
17
32
19
14
10
18
15
18a
9

FIG. 3

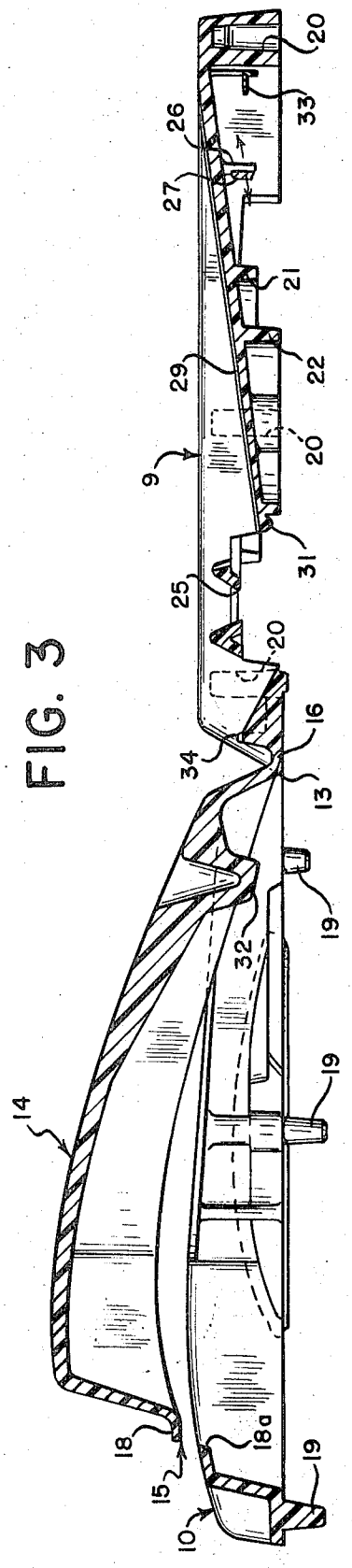
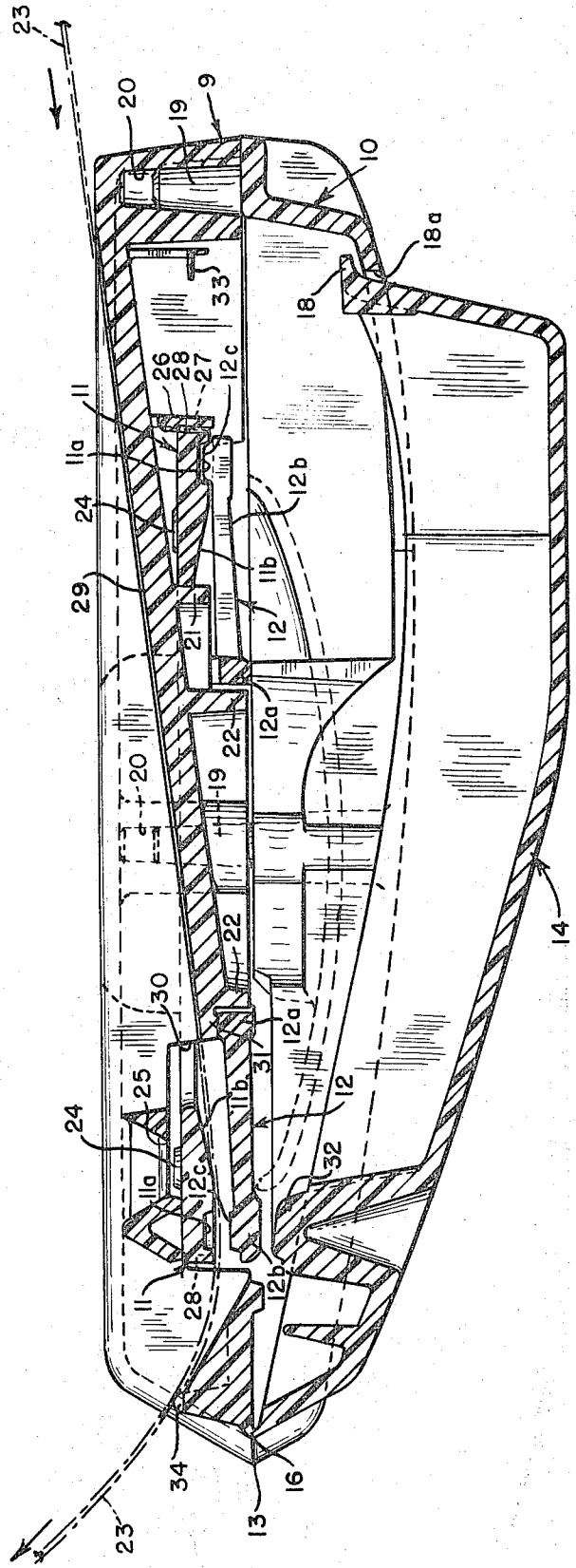

20
33
26
27
21
22
29
9
31
25
16
34
13
19
32
14
18
18a
15
10

FIG. 5


23
20
19
9
10
18a
18
33
26
28
27
12c
11
11a
24
12b
29
11b
12
21
12a
22
19
20
22
14
30
12a
31
25
12
24
11b
32
11a
12c
11
28
12b
34
16
13
23

EMBOSSING TOOL

This invention relates to apparatus for making labels and, more particularly, to a tool for embossing a strip of embossable material.

The presently available low cost tape embossers comprise a pair of rotatable embossing wheels mounted in a housing for planar rotation about a common axis, and a strip of embossing tape is fed tangentially between the two mating embossing discs. U.S. Pat. No. 3,633,722, is representative of such an embosser. When a lever is pressed to force a letter-shaped punch on one disc against the tape over a corresponding letter-shaped die on the other disc, this letter becomes embossed on the tape positioned between the punch and the die, but because of the tangential feed of the strip the spacing of the embossed letters or numerals cannot be visually monitored and automatic advancing mechanism is required for advancing the tape strip. Other embossers designed to emboss tape fed radially of the embossing discs generally involve many operating parts, some of critical dimensions, and additional complexity has resulted from the components designed to hold, feed and cut a supply of the embossable tape. U.S. Pat. Nos. 3,155,215, 3,277,992, 3,339,694, 3,391,773 and 3,414,102 are representative of tape embossing tools having the latter features.

The embossing tool of the present invention is adapted to emboss relatively short strips of tape rather than the full length of a roll of tape. Nevertheless, the tool of the invention consists of only three separate parts: two embossing discs and a once-piece foldable housing, yet it provides for an embossable strip to be advanced manually but controllably through a portion of the body of the tool to an embossing station in the tool along a path radially of and between the pair of embossing discs. The tool comprises a one-piece housing composed essentially of two mating housing portions integrally connected along a central transverse fold line and brought into mating position by being folded about said line, an embossing lever formed from a longitudinal central section of one housing portion, the lever being hinged to the housing by being integrally connected by a transverse fold line at its hinged end to the other of the housing portions, a pair of mating embossing discs positioned within the housing, means for separating the embossing discs adjacent the embossing station, means for feeding a strip of embossable material radially of and between the separated portions of the embossing discs, and pressing means on the embossing lever for pressing the separated portions of the embossing discs into embossing contact with a strip of embossable material positioned therebetween.

These and other novel features of the invention will be more fully understood from the following description taken in conjunction with the accompanying drawing in which

FIG. 1 is a plan perspective view of the embossing tool of the invention;

FIG. 2 is a top plan view of the tool housing and embossing lever assembly as extruded;

FIG. 3 is a section taken along line 3—3 in FIG. 2;

FIG. 4 is a top plan view, partly broken away, of the assembled embossing tool; and

FIG. 5 is a section taken along line 5—5 in FIG. 4.

As shown generally in FIG. 1, the embossing tool comprises an upper housing portion 9, a lower housing portion 10, and upper embossing disc 11 and a lower embossing disc 12, all formed of conventional thermoplastic synthetic resin, such as medium impact strength polystyrene, by conventional injection molding technique. The two housing portions 9 and 10 are integrally connected along an intermediate transverse fold line provided, as shown in FIG. 2, by a thin planar land 13 which forms the junction of the two housing portions in the molded shape. An embossing lever 14 is formed predominantly out of a longitudinal central section of the lower housing portion 10 and to a minor extent out of an adjoining longitudinal central section of the upper tool housing portion 9. The lever 14 has a free end 15 terminating inboard of the outboard end of the lower housing portion 10 and has a hinged end fold line 16 provided again by a thin planar transverse land 17 positioned in the lower tool housing portion 9 slightly inboard of the fold line-forming land 13 which joins the two housing portions. The free end 15 of the embossing lever is advantageously provided with a longitudinal projecting limiting flange 18. One of the tool housing portions is provided with conventional press fit pins 19 and the other tool housing portion is provided with mating press fit pin holes 20.

When the two housing portions 9 and 10 are folded about their transverse fold land 13, while simultaneously or previously folding the embossing lever 14 about its folding line 16, and the two housing portions are pressed sufficiently hard for the pins 19 to become secured in the pin holes 20, it will be seen from FIG. 5 that the location of the embossing lever fold line 16 inboard of the fold line for the integrally formed tool housing portions causes the embossing lever to be displaced inwardly from the housing portion hinge line. As a result, the flange 18 at the free end of the embossing lever is moved outboard (to the right in FIG. 5) under the adjacent part 18a of the tool housing portion from which it was formed so that the flange 18 limits the outward movement of the lever and maintains it in operative position in the assembled tool.

As can be seen from FIGS. 2 and 3, the upper tool housing portion 9 is formed with raised arcuate segments 21 of sufficient radius to form a hub for the larger internal diameter of the annular upper embossing disc 11. Concentrically positioned within the segments 21 is an upstanding collar 22 of smaller radius than the segments 21 and which forms a hub for the smaller internal diameter of the annular lower embossing disc 12. The upper embossing disc 11 and the lower disc 12 are of substantially the same outer diameter, and although they are both annular in shape they have different internal diameters. The die-bearing upper disc 11 is the one with a larger internal diameter mentioned previously as being mounted on the hub formed by the arcuate segments 21. The punch-bearing lower disc 12 is of smaller internal diameter and is mounted on the hub formed by the raised collar 22. The lower disc 12 is formed of a central ring portion 12*a* having outwardly extending fingers 12*b* each of which carries one of the die punches 12*c*. The punches, like the dies 11a in the upper embossing disc 11, are arranged with their vertical reading centerline tangent to a concentric circle positioned inboard from the edge of their respective discs. As a result, indicia embossed by mating punch and die are formed in a tape strip 23 with their vertical

reading centerline transverse to the longitudinal axis of the strip as desired in labels. Identifying indicia **24** are positioned on the opposite surface from the dies of the upper embossing disc **11,** and the body of the upper housing portion **9** is provided with a window opening **25** through which the identifying indicia **24** can be seen. In order to hold the mated embossing discs in the position chosen by the identifying letter or numeral appearing in the housing window **25,** the housing is provided with a springlike bar **26,** having a central boss **27,** positioned opposite the housing window **25** so that the boss **27** can engage detents **28** formed around the peripheral edges of the embossing disc **11.**

On the underside of the upper housing portion **9** as viewed in FIG. **2,** (the top of this housing portion in FIGS. **1, 4** and **5**) there is also formed a sloping channel-shaped ramp **29** extending longitudinally of the housing portion **9** and across the center of the hubs formed by the arcuate segments **21** and the collar **22.** The inboard end of the ramp **29** terminates in an opening **30** positioned so that the tape strip **23** moving in the ramp **29** can penetrate between the two embossing discs **11** and **12** in a direction along the radii of the aligned embossing discs. In order to facilitate the entry of the tape between the discs, the underside **11***b* of the upper disc **11** is chamfered adjacent its central opening and the innermost edge **31** of the ramp is raised to extend to a height approximately one-half the distance between the tops of the arcuate hub segments **21** and the top of the collar **22.** When the two embossing discs are placed on their respective hubs formed by the segments **21** and the collar **22,** respectively, and their hubs are pressed together by the joined housing portions, the raised ramp edge **31** serves as a cam to raise the central ring portion **12***a* and hence the fingers of the lower embossing disc **12** adjacent the embossing station and thus provides a tape-entry space between the discs. Inasmuch as the two embossing discs are in inner face-to-face contact everywhere except at the finger-raising tape ramp edge **31,** the punches and dies are in mating contact and hold the two discs in tape-embossing registry at all times.

The tape **23** to be embossed is fed into the tool in strips of suitable length for making individual labels. One end of a strip is placed in the tape ramp **29** and is pushed inwardly along the ramp until its leading end penetrates the space between the upper and lower embossing discs held apart at the embossing station by the raised ramp edge **31** acting against the central ring portion **12***a* of the lower disc **12.** The mated embossing wheels are turned until the indicium of the desired embossing appears in the housing window **25.** The embossing lever **14** is then pressed inwardly of the tool housing to force a presser plate **32** on the inner surface of the lever against the aligned lower disc finger **12***b* held away from the tape by the raised ramp edge **31.** The pressure of the plate **32** against the end of the punch-bearing disc finger **12***b* causes the finger to flex and to press the tape between the die and punch to emboss the tape. As the embossing lever **14** reaches a position which effects this embossing, it has been found advantageous to provide a clicking sound by positioning a spring blade **33** so that it will make a cricket-like noise as the flanged end **18** of the embossing lever snaps past it.

The tape **23** is held firmly in position during embossing by a built-in clutch feature in the form of a deflector bar **34** at the end of the upper tool housing from which the tape exits the embossing station. The deflecting bar causes the tape to be bent as it leaves the embossing station (as shown in FIG. **5**) and the resulting friction between the bent tape and the ramp and deflecting bar tends to hold the tape against undesired longitudinal movement. However, after each embossing operation, the tape is moved freely one space until the last-embossed letter or number appears beyond the ramp window **25,** and then the aforementioned friction will hold the tape during the next embossing operation.

As an aid to centering the label lettering in the tape strip, the sides of the ramp **29** can be provided with appropriate numbers and scribe marks **35.** These numbers and marks are so positioned with respect to the embossing station that when, for example, a label requiring a total of 11 letters and spaces is desired, the initial positioning of a tape strip of predetermined length in the ramp **29** with its trailing end positioned at "11" in the ramp will provide the finished embossed label with its letters centered lengthwise of the tape strip.

It will be seen, accordingly, that the tape embossing tool of the present invention is composed of only three parts: the housing, which includes the two housing portions and the embossing lever all formed integrally of a single extrusion, and the two embossing discs. All other components necessary to the embossing operation are permanently formed within the extruded housing-embossing lever assembly and no other moving parts or assembly of parts are required.

I claim:

1. A tool for embossing a strip of embossable material wherein the strip is advanced through a portion of the body of the tool to an embossing station in the tool along a path radially of a pair of mating embossing discs, said tool comprising a one-piece housing composed essentially of two mating housing portions integrally connected along a central transverse fold line and brought into mating position by being folded about said line, an embossing lever formed from a longitudinal central section of one housing by being integrally connected by a transverse fold line at its hinged end to the other of the housing portions, a pair of mating embossing discs positioned within the housing, means cooperating with said discs for separating the discs at a location adjacent to the embossing station, channel means formed in the housing for guiding the strip of embossable material radially of and between the separated portions of the embossing discs, and pressing means on the embossing lever for pressing the separated portions of the embossing discs into embossing contact with a strip of embossable material positioned therebetween.

2. A tool for embossing a strip of embossable material according to claim **1** wherein the embossing lever is formed to a major extent from a longitudinal central section of one housing portion and to a minor extent from an adjoining longitudinal central section of the other housing portion.

3. A tool for embossing a strip of embossable material according to claim **1** wherein the embossing lever is hinged to the other of the two housing portions.

4. A tool for embossing a strip of embossable material according to claim **1** wherein the formation of the embossing lever creates a housing opening in a section of the housing and wherein the lever is hinged to the

housing inboard of one end thereof and is provided at its end opposite said hinge with a flange member extending internally of the housing beyond the housing opening for said embossing lever.

5. A tool for embossing a strip of embossable material according to claim **1** including means for maintaining the embossing discs in die-member mating registry throughout the entire discs other than immediately adjacent the embossing station.

6. A tool for embossing a strip of embossable material according to claim **1** wherein one of the mating embossing discs is formed of a central annular ring portion having outwardly extending fingers each carrying one of the die members, and the means for separating the embossing die members adjacent the embossing station comprises a cam surface adapted to displace a section of the aforementioned annular ring and thus displace the fingers of said one embossing disc adjacent the embossing station away from the corresponding die member of the other embossing disc.

7. A tool for embossing a strip of embossable material according to claim **1** wherein the means for feeding the strip of embossable material radially of and between the separated portions of the embossing discs comprises a ramp formed in one of the housing portions and provided with indicia for initial placement of the trailing end of the strip to insure centering of embossed information lengthwise of the strip.

8. An embossing tool for use with embossable tape comprising

a. a pair of embossing discs supported in the housing for rotation in intimate contact with each other;
b. spring means for urging said discs toward one another;
c. said housing provided with
   i. an embossing lever hingedly joined to one of the housing portions by a resilient web of the housing material; and
   ii. a tape-locating channel adapted to direct the embossable tape between the discs and radially thereof;
d. an embossing station adjacent said channel;
e. embossing station actuating means including said embossing lever; and
f. spreading means adapted to spread the discs apart adjacent an embossing station to permit the tape to enter therebetween and be embossed.

9. An embossing tool in accordance with claim **8** wherein said hinge joint is offset inboard of and parallel to one end of the housing.

10. An embossing tool in accordance with claim **8** wherein the offset embossing lever hinge causes a longitudinally projecting flange on the opposite end of the embossing lever to be enclosed by the mating housing portions in their joined condition.

11. An embossing tool for use with embossable tape comprising

a. a pair of embossing discs supported in the housing for rotation in intimate contact with each other;
b. spring means for urging said discs toward one another;
c. said housing provided with
   i. an embossing lever hingedly joined to one of the housing portions; and
   ii. a tape-locating channel having markings to indicate prior to making the first embossment the starting position of the tape strip for centering an embossed legend of predetermined length thereon and adapted to direct the embossable tape between the discs and radially thereof;
d. an embossing station adjacent said channel;
e. embossing station actuating means including said an embossing lever; and
f. spreading means adapted to spread the discs apart adjacent an embossing station to permit the tape to enter therebetween and be embossed.

* * * * *