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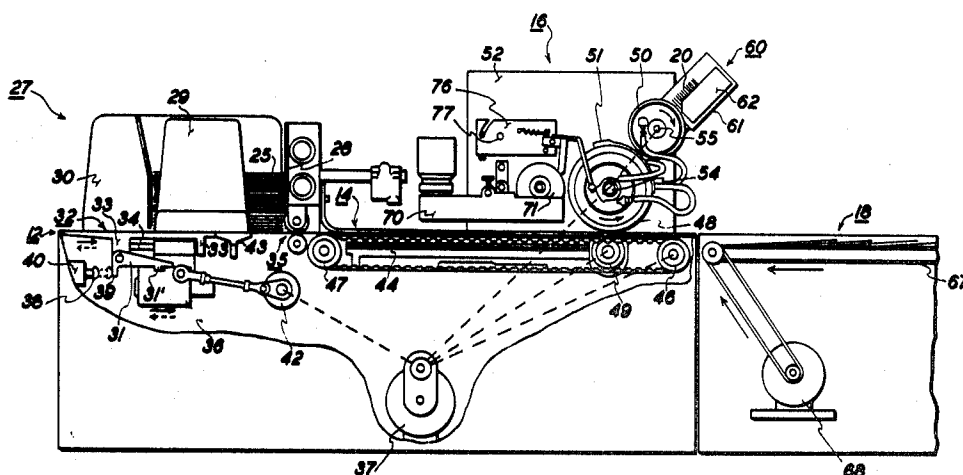
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[54] **LABELING APPARATUS FOR MULTISHEET
LABELS**
8 Claims, 4 Drawing Figs.

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156/567, 156/521, 156/553, 118/249
[51] Int. Cl. **B32b 31/20,**
B05c 1/02
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29; 118/211, 249, 250; 156/568, 571, 521, 548,
553, 567, 285, 291, 582

ABSTRACT: An article-labeling system having an article supply means; a labeling head including a label transfer wheel; a source of labels of the type comprising one or more information-bearing sheets projecting from a common stem; means to apply adhesive to the label stems to enable the transfer wheel to affix the labels to the articles by their stems; and means operable on the label sheets to prevent the label sheets from contacting the adhesive-applying means to avoid application of adhesive to the label sheets and undesired adhering of the label sheets to the articles and/or to one another.



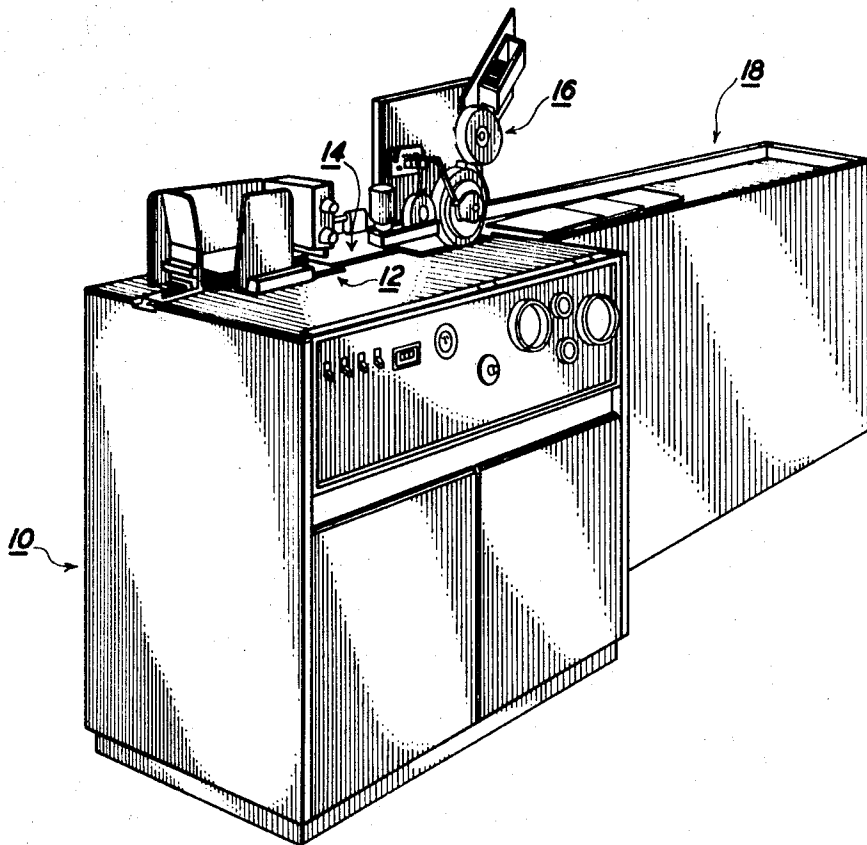


FIG. 1

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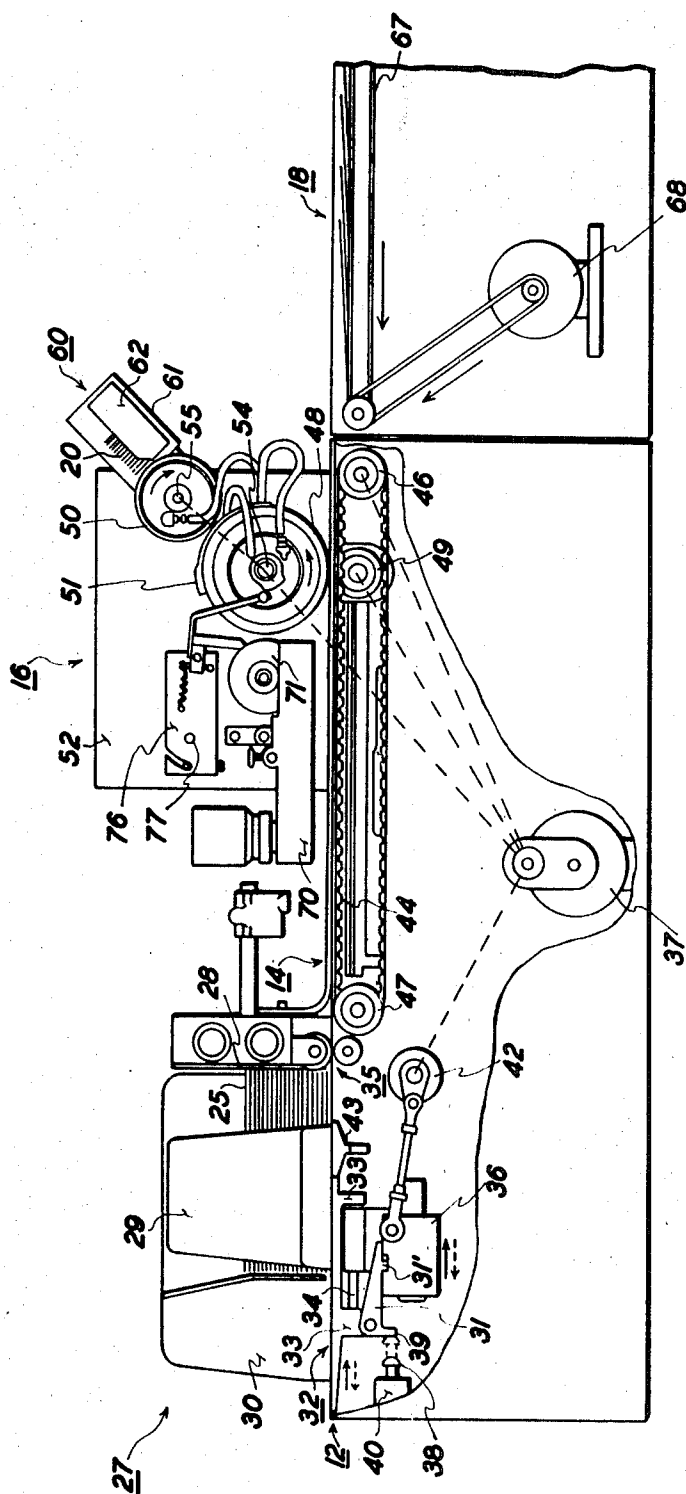


FIG. 2

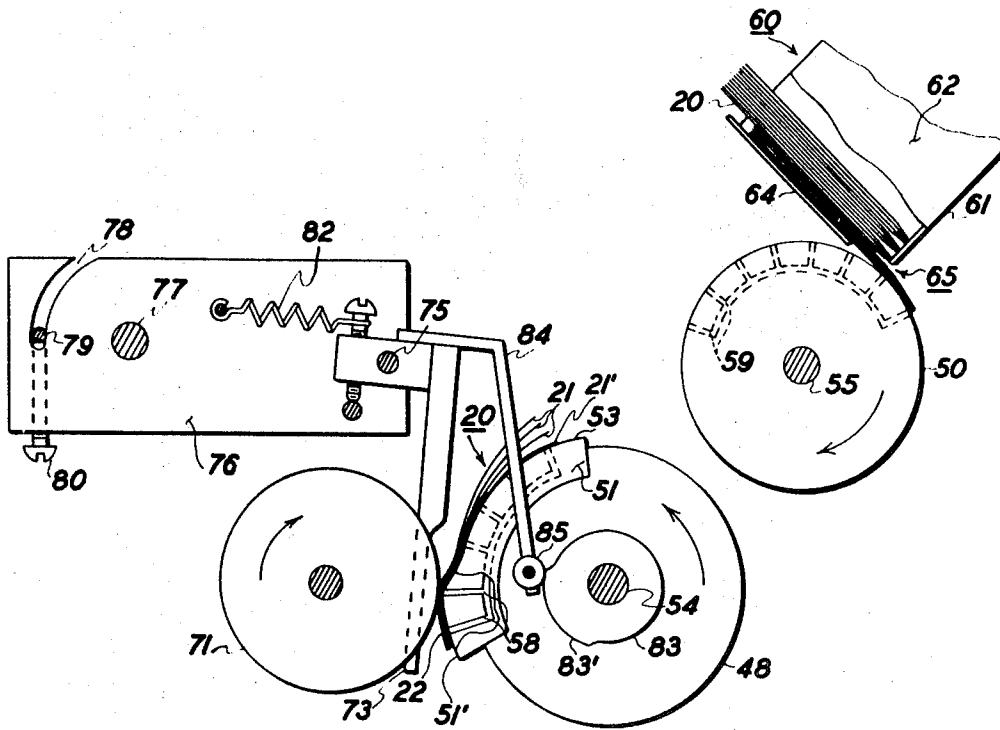


FIG. 3

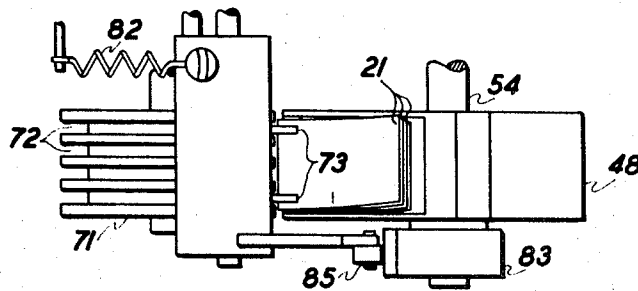


FIG. 4

LABELING APPARATUS FOR MULTISHEET LABELS

This invention relates to an article-labeling apparatus, and more particularly, to labeling apparatus for applying removable or tearaway labels.

In a labeling operation, there is often used labels of the type having one or more parts designed to be later separated or torn away from the label. Such labels usually comprise a booklike sheaf of sheets such as address forms, tickets, or the like attached to a larger sheet or paper, which may bear instructions, advertising, etc. respecting the use of the tearaway portions of the labels. However, the use of this type of label with high-speed automatic labeling machines is difficult since the adhesive should be applied only to the label stem and not to the relatively loose tearaway sheets of the label. Unfortunately, the adhesive, which is normally in liquid form, is difficult to handle and apply, and often spills or splashes on the tearaway sheets of the labels, rendering later removal of these sheets difficult or impossible.

It is a principal object of the present invention to provide a new and improved labeling apparatus.

It is a further object of the present invention to provide an improved adhesive-applying means for a labeling apparatus adapted to effectively apply adhesive to a predetermined portion of a label only.

It is an object of the present invention to provide a new and improved labeling apparatus for multisheet labels effective to affix the labels to articles by their stems only with the label sheets being free for subsequent removal.

It is an object of the present invention to provide, in conjunction with means to apply adhesive to labels, a mechanism for holding a portion of the labels away from the adhesive-applying means and prevent application of adhesive to that portion of the labels.

This invention relates to an apparatus for transferring labels of the type having one or more information-bearing sheets projecting loosely from a common stem onto articles, the combination comprising: means for feeding articles to be labeled forward; label transfer means including a label carrier adapted to bring the labels into contact with the articles; means for applying adhesive to the stems of labels on the carrier before the labels are brought into contact with the articles; and means operable to prevent the label sheets from contacting the adhesive applying means to avoid the application of adhesive to the label sheets and possible undesired adhering of the label sheets to the articles.

Other objects and advantages will be apparent from the ensuing description and drawings in which:

FIG. 1 is a perspective view of the labeling apparatus used in the labeling system of the present invention;

FIG. 2 is a side view partially in section of the labeling apparatus shown in FIG. 1;

FIG. 3 is an enlarged view showing details of the adhesive-applying mechanism of the present invention; and

FIG. 4 is a top view of the mechanism shown in FIG. 3.

In the accompanying drawings, the reference numeral 10 indicates in general the article-labeling or -addressing apparatus of the present invention. Article-labeling apparatus 10 includes an article feeder 12, article transport 14, and labeling head 16. An article conveyor 18 may be provided to facilitate handling of labeled articles. Alternately, an article stacker (not shown) may be provided to handle the labeled articles discharged by the article-labeling apparatus 10.

Referring particularly to FIG. 2, a magazine 27 for articles 25 to be labeled comprising upstanding front gate 28, sidewalls 29, and rear wall 30 is provided. Magazine 27 serves to contain the supply of articles, i.e. envelopes, magazines, or the like to be labeled. Gate 28 is slightly above the level of reciprocable article feeder shuttle 32 and cooperates therewith to limit feed to one article at a time. As will appear, the labels 20 are transferred to the articles 25 by physically attaching or bonding individual labels to the articles. The article magazine 27 is preferably adjustable in size to accommodate various sized articles 25.

The article feeder 12 has a reciprocating shuttle 32 adapted to carry the bottommost one of the articles 25 forward under front gate 28 and into the nip of article feed roll pair 35. Shuttle 32 comprises a platelike member with depending brackets 33 journaling shuttle 32 for reciprocating movement on a pair of bearing rods 34. Shuttle 32 is driven from motor 37 by means of a selectively disengageable latch 31. Latch 31, which is pivotally mounted on shuttle 32, has a depending drive lug 31' normally received in a suitable driving recess of reciprocating slider 36. A stop 38, which may be disposed in the path of movement of lower latch pivot arm 39 by means of solenoid 40, is provided. As can be understood, energization of solenoid 40 moves stop 38 forward so that, on return movement of shuttle 32 (in the direction shown by the dotted line arrow of FIG. 2), latch arm 39 contacts stop 38 to pivot latch 31 upwardly and disengage shuttle 32 from driving slider 36. Slider 36 may be driven by motor 37 through a suitable eccentric mechanism 42 effective to impart reciprocating movement to slider 36 on rotation of motor 37.

Shuttle 32 is preferably provided with suitable vacuum hold down ports (not shown) serving, on forward or feeding movement of shuttle 32, to attach the bottommost one of the documents 25 in magazine 27 to shuttle 32 as will be understood by those skilled in the art. A suitable control valve 43 serves to close off the vacuum ports on the return stroke of shuttle 32.

The feed roller pair 35, which are disposed between the discharge of shuttle 32 and conveyor belts 44 of article transport 14, carry the articles 25 forward from shuttle 32 to belts 44.

Article transport 14 comprises a plurality of spaced belts 44 supported across drive and idler rollers 46, 47 respectively. Roller 46 is suitably driven from motor 37. Suitable holddown rollers (not shown) may be provided to hold the articles 25 in driving contact with belts 44 along the length thereof.

There is provided opposite label transfer wheel 48 a resilient pressure roller 49, the periphery of which is substantially level with that of transport conveyor belts 44. As will appear, roller 49 cooperates with land portion 51 of transfer wheel 48 to transfer labels 20 to articles 25. Pressure roller 49 is driven by motor 37 at the same surface speed as transport 44 by suitable means.

Labeling head 16 includes frame 52 which is preferably both vertically and horizontally adjustable. Frame 52 has transfer wheel and label feed wheel shafts 54, 55 rotatably journaled thereon. Shafts 54, 55 are suitably driven by motor 37, motor 37 rotating transfer wheel shaft 54 in a counterclockwise direction as seen in FIG. 2 and label feed wheel shaft 55 in the opposite or clockwise direction. Transfer and label feed wheels 48, 50 are mounted on shafts 54, 55 respectively, wheels 48, 50 being in substantial transverse alignment with one another.

Transfer wheel 48 includes at least one radial protruding land 51 on the periphery thereof on which individual labels 20 are brought by wheel 48 into physical contact with the articles 25. Vacuum holddown ports 58 (shown in FIG. 3) are provided at suitably spaced points along the arcuate length of land 51 to selectively hold the individual labels thereon. Vacuum is supplied to ports 58 from a suitable vacuum source, there being suitable vacuum control valve means (not shown) provided in wheel 48 to regulate the admission of vacuum to ports 58 as will appear more fully hereinafter. Land 51 may include one or more heating elements (not shown) imbedded therein to facilitate bonding of labels 20 onto the articles 25.

Label feed wheel 50 is supported on shaft 55 such that the periphery of wheel 50 is spaced closely adjacent the path of rotation of transfer wheel land 51 to enable labels 20 to be transferred from feed wheel 50 onto land 51 of transfer wheel 48 as will appear hereinafter. Label feed wheel 50 has suitable vacuum holddown ports 59 along a portion of the surface thereof designed to enable individual labels 20 to be attached thereto for transfer from label supply chute 60 to transfer wheel 48. Ports 59 in label feed wheel 50 communicate with

the vacuum source through suitable vacuum control valve means (not shown).

Referring particularly to FIG. 3, label supply chute 60 includes an upwardly inclined base 61 having a leading or lower edge disposed proximate the periphery of label feed wheel 50. A pair of spaced sides 62 are disposed above base 61, sides 62 being spaced apart by a distance slightly greater than the width dimension of labels 20. A forward wall 64 is provided, wall 64 being spaced above base 61 to form a discharge opening 65 for labels 20 proximate the periphery of label feed wheel 50.

Labels 20 are stored on edge in chute 60 between sides 62 and against wall 64. The angle of inclination of chute 60 is preferably such that labels 20 move by gravity down chute 60 as individual labels are withdrawn from chute 60 by feed wheel 50. If desired, a weight or block (not shown) may be placed in chute 60 behind the supply of labels 20 to bias labels 20 forward in chute 60 toward wheel 50.

Article conveyor 18 includes one or more endless conveyor belts 67 arranged below the discharge end of articles transport 14. As a result, labeled articles leaving transfer wheel 48 drop onto the moving belts 67 one upon the other in overlapping or shingled form as illustrated in FIG. 2. Conveyor belts 67 are driven by motor 68 which may be operated continuously during the labeling operation.

A suitable source of adhesive or glue, such as container 70, is provided. An applicator roller or wheel 71 is arranged to contact a portion of the underside of the labels 20 carried therepast on land 51 of transfer wheel 48 as transfer wheel turns (in a counterclockwise direction shown by the solid line arrow of FIG. 20). A suitable wiper (not shown) serves to limit the amount of glue entrained on wheel 71.

As best seen in FIGS. 3 and 4 of the drawings, labels 20 comprise one or more sheetlike parts 21 joined to a common stem or tab 22. As can be understood, the label sheets 21 are normally intended to be removed, either separately or in unison, by the party using the article. To obviate unintended or inadvertent application of adhesive to the rather loose label sheets 21 through contact with glue wheel 71 or from splashing or spilling of glue from glue wheel 71, the land 51 of transfer wheel 48 is undercut at 53 along an arcuate length corresponding substantially to the length of label sheets 21. In order to prevent any permanent deformation or damage to the labels 20, a radius is preferably provided between the remainder 51' of land 51 and undercut 53.

To prevent the loose label sheets 21 from contacting glue wheel 71, one or more fingers 73 are provided opposite transfer wheel 48 to hold the label sheets 21 away from wheel 71 and against undercut 53 as wheel 48 carries the label past glue wheel 71. To prevent fingers 73 from interfering with the application of glue by wheel 71 to the label stem 22 on land portion 51', the periphery of wheel 71 has circumferential recesses 72 therein, the depth of recesses 72 being at least equal to and preferably slightly greater than the thickness of fingers 73.

Fingers 73 are preferably supported for limited swinging movement by shaft 75. Shaft 75 is mounted on supporting member 76 which in turn is mounted for limited swinging movement by shaft 77 on frame 52.

Member 76 has a control slot 78 therein within which pin 79 on frame 52 is disposed. Screw-type abutment 80 is supported on member 76 for engagement with pin 79, abutment 80 and pin 79 cooperating to limit rotation of member 76 about shaft 77 in the clockwise direction.

Spring 82, disposed between fingers 73 and member 76, biases fingers 73 in a counterclockwise direction. To provide for automatic operation of fingers 73 in timed relation with movement of labels 20 past glue wheel 71, a suitably configured cam 83 is mounted on transfer wheel support shaft 54. Fingers 73 have a cam follower 84 attached thereto, roller 85 of follower 84 being in physical contact with the periphery of cam 83.

As will be understood by those skilled in the art, transfer and label feed wheels 48, 50 are rotated in timed relation to another. As holddown ports 59 in feed wheel 50 near the label discharge opening 65 in label supply chute 60, vacuum is admitted thereto and the first or lowermost label in chute 60 is drawn out through opening 65 and onto wheel 50 as wheel 50 rotates therepast.

Label feed wheel 50 carries the extracted label in the clockwise direction shown by the arrow in FIG. 3 around toward transfer wheel 48, the land portion 51 of which is nearing feed wheel 50 in timed relation thereto. Vacuum is admitted to holddown ports 58 in land 51 and as the label-bearing portion of label feed wheel 50 and land 51 of transfer wheel 48 pass opposite each other, the vacuum supply to ports 59 of label feed wheel 50 is interrupted and the label is transferred from feed wheel 50 onto land 51 of transfer wheel 48 with stem 22 of labels 20 resting on land portion 51' while the sheets 21 of labels 20 are opposite undercut 53 of land 51. It is understood that vacuum ports 58 serve to hold labels 20 on transfer wheel 48.

Where label 20 comprises a single sheet label, the vacuum holddown ports 58 hold the label including sheet 21 thereof in tight engagement with the entire land 51. Where labels 20 comprise multisheet labels, vacuum ports 84 are normally effective to hold only the lowermost sheet or sheets 21' thereof against land 51, the remaining label sheets being relatively loose.

As wheel 48 carries the label 20 past glue wheel 71, wheel 71 applied glue to the underside of the label stem 22. As the undercut 53 of land 51 nears glue wheel 71, cam follower 84 moves off lobe 83', of cam 83 permitting spring 82 to pivot fingers 73 outwardly and into pressing contact with the label sheets 21. Fingers 73 serve to hold the relatively loose label sheets 21 against undercut 53 thereby preventing inadvertent application of glue thereto by wheel 71.

The continued movement of transfer wheel 48 brings the label 20 thereon into contact with the article 25 disposed therebelow on the moving belts 44 of article transport 14. The pressure between land 51' of transfer wheel 48 and the resilient pressure roller 49 functions to press label stem 22 against the article 25 to thereby affix the label 20 onto the article 25. The label sheets 21 are not directly attached to the article 25 facilitating later removal by the recipient.

Where it is desired to shutdown or service the labeling head 16, the entire finger assembly may be moved aside by swinging member 76 in a counterclockwise direction about support shaft 77, the dimensional relationships between the several parts that make up the finger assembly being such as to permit both fingers 73 and cam follower 85 to clear wheel 48 and cam 83 respectively. It is understood that transfer wheel 48 is turned so that land 51 is out of the way.

While we have described and illustrated herein a preferred form of our invention it will be apparent to those skilled in the art that changes and modifications may be made thereto without departing from the spirit and intent of our invention which is to be limited only to the scope of the appended claims.

What is claimed is:

1. In an apparatus for transferring labels of the type having one or more information-bearing sheets projecting loosely from a common stem onto articles, the combination of: means for feeding articles to be labeled forward; label transfer means including a label carrier adapted to bring said labels into contact with said articles; means for applying adhesive to the stems of said labels on the carrier before the labels are brought into contact with said articles and; means operable to prevent said label sheets from contacting said adhesive-applying means to avoid the application of adhesive to said label sheets and possible undesired adhering of said label sheets to said articles.
2. The apparatus according to claim 1 in which said label carrier comprises a rotatable wheel-like transfer member

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operatively disposed adjacent said article-feeding means, said transfer member having at least one radially projecting peripheral surface portion adapted on rotation of said transfer member to carry labels past said adhesive-applying means for application of adhesive onto the stem portions thereof and thereafter into contact with the article being labeled;

said transfer member peripheral surface portion being undercut where said label sheets normally overlay said transfer wheel surface portion, said label sheet preventing means including means to move said label sheets toward said undercut surface portion and thereby prevent said adhesive-applying means from applying adhesive to said label sheets as said labels are carried therepast by said transfer member.

3. The apparatus according to claim 2 in which said label sheet-preventing means includes vacuum means on said transfer member adapted to hold at least one of said label sheets tightly against said transfer member undercut portion and out of contact with said adhesive-applying means.

4. In an apparatus for transferring labels of the type having one or more information-bearing sheets projecting loosely from a common stem onto articles, the combination of:

means for feeding articles to be labeled forward;
label transfer means including a label carrier adapted to bring said labels into contact with said articles;

means for applying adhesive to the stems of said labels on the carrier before the labels are brought into contact with said articles;

means operable to prevent said label sheets from contacting said adhesive-applying means to avoid the application of adhesive to said label sheets and possible undesired adhering of said label sheets to said articles,

said label carrier comprising a rotatable wheellike transfer member operatively disposed adjacent said article-feeding means, said transfer member having at least one radially projecting peripheral surface portion adapted on rotation of said transfer member to carry labels past said

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adhesive-applying means for application of adhesive onto the stem portions thereof and thereafter into contact with the article being labeled,

said transfer member peripheral surface portion being undercut where said label sheets normally overlay said transfer wheel surface portion, said label sheet-preventing means including at least one movable fingerlike member adapted to force said label sheets toward said transfer member undercut portion and out of contact with said adhesive-applying means.

5. The apparatus according to claim 4 including means for operating said finger in timed relation with rotation of said transfer member so that said finger is moved toward said label sheets as said label sheets are carried past said adhesive-applying means by said transfer member.

6. The apparatus according to claim 4 in which said adhesive-applying means comprises an applicator roller having an adhesive-bearing periphery in juxtaposition with said transfer member radial surface portion so that on rotation of said transfer member therepast said roller applies adhesive to the stem of labels on said transfer member surface portion;

said adhesive-applying roller having at least one circumferential recess about the periphery thereof to enable said finger to retract therewithin at least while said roller applies adhesive to said label stem.

7. A label transfer wheel for use with multisheet labels, said wheel having at least one radially projecting land adapted to support on the periphery thereof individual ones of said labels for application of adhesive to the label and transfer of the label to the article being labeled, said transfer wheel land including an undercut portion substantially coextensive with said label sheets to enable said label sheets to assume a position below the periphery of said land and avoid undesired application of adhesive to said label sheets.

8. The label transfer wheel of claim 7 including means to hold said label sheets against said land undercut portion and thereby prevent application of adhesive thereto.

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