March 19, 1974 W. A. JENKINS ET AL 3,798,106

LABEL PRINTING AND APPLYING APPARATUS

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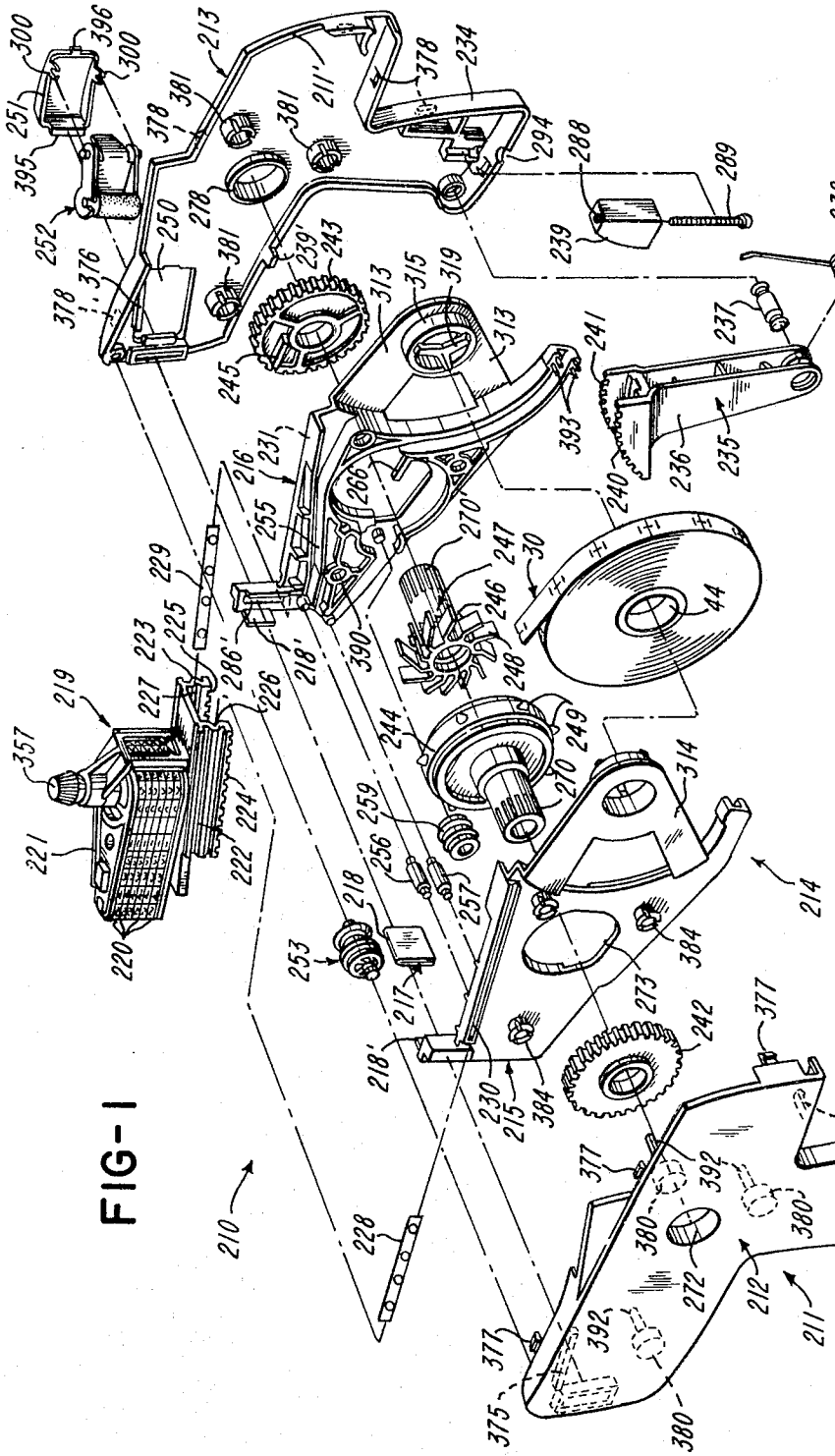


FIG-1

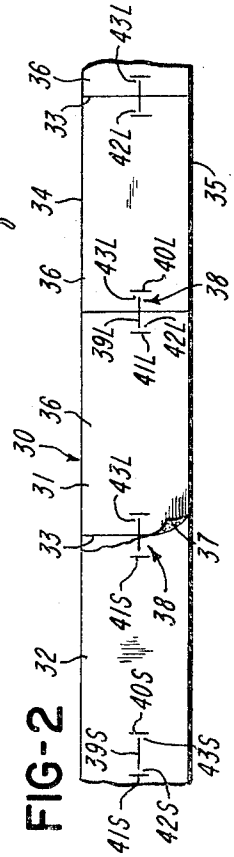
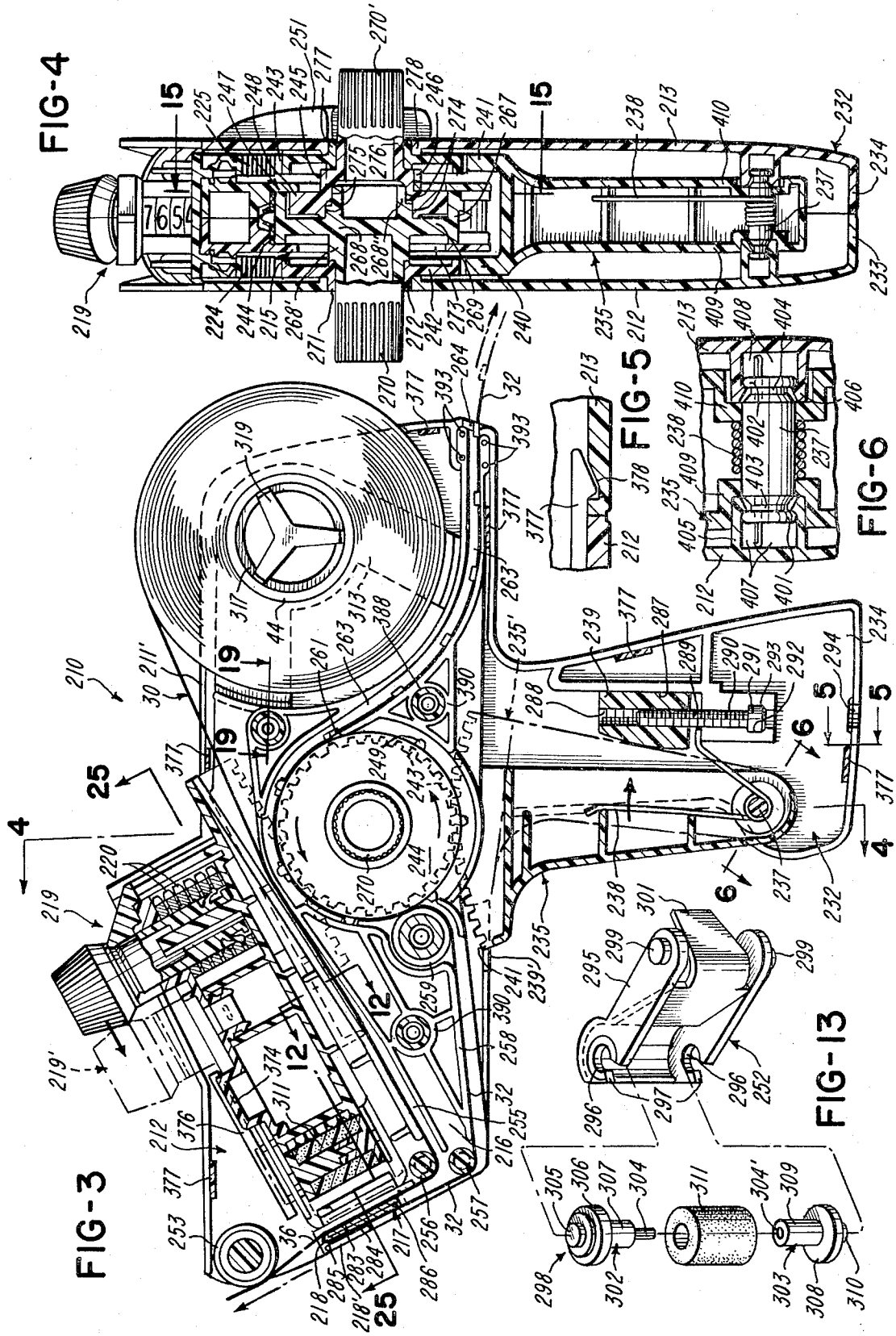


FIG-2

LABEL PRINTING AND APPLYING APPARATUS

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LABEL PRINTING AND APPLYING APPARATUS

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FIG-7

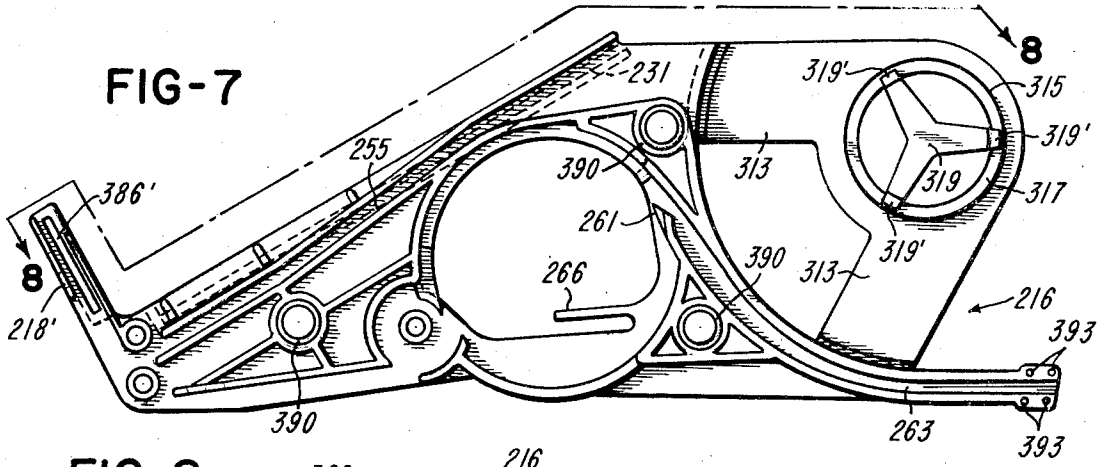
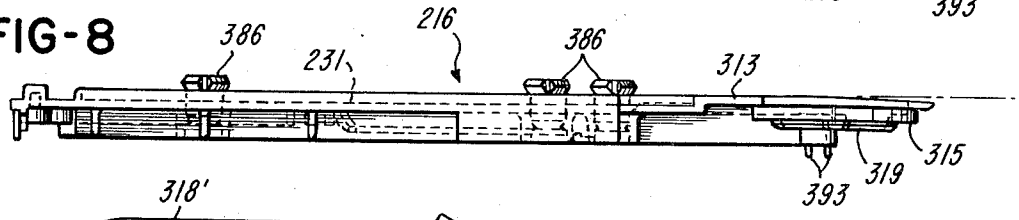


FIG-8



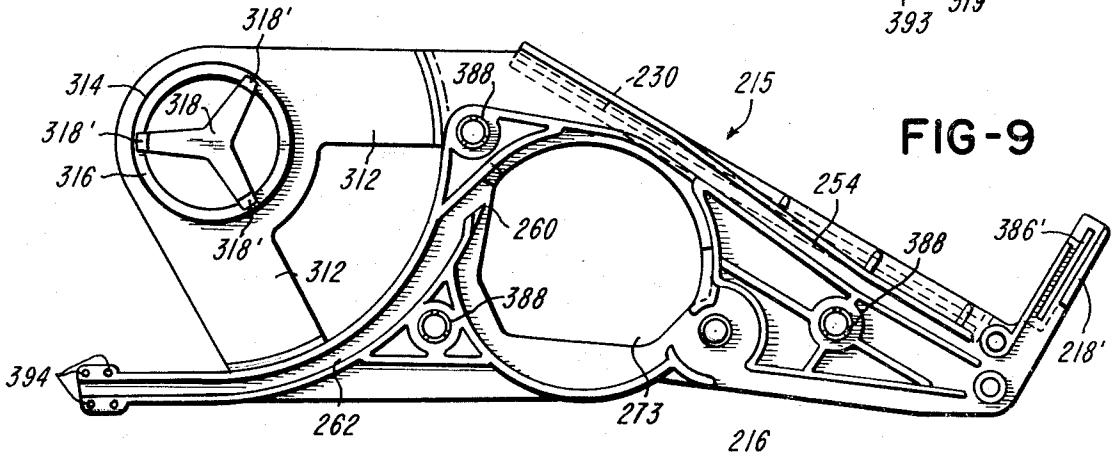


FIG-9

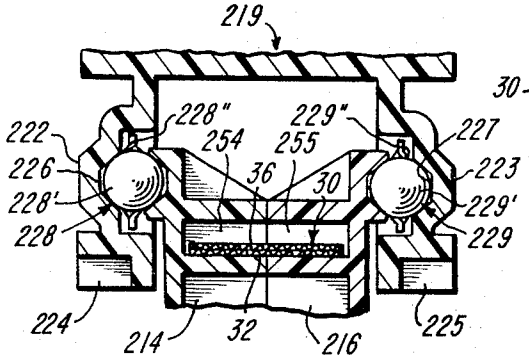


FIG-12

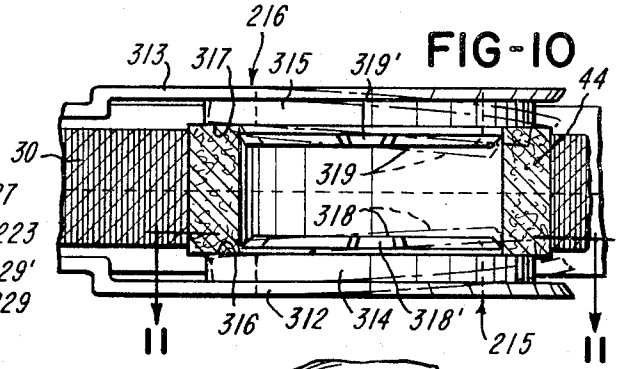


FIG-10

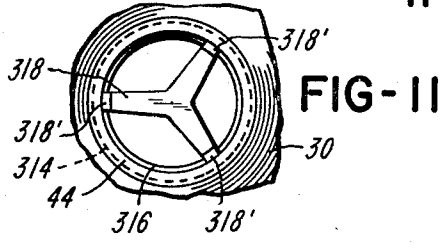


FIG-11

LABEL PRINTING AND APPLYING APPARATUS

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FIG-14

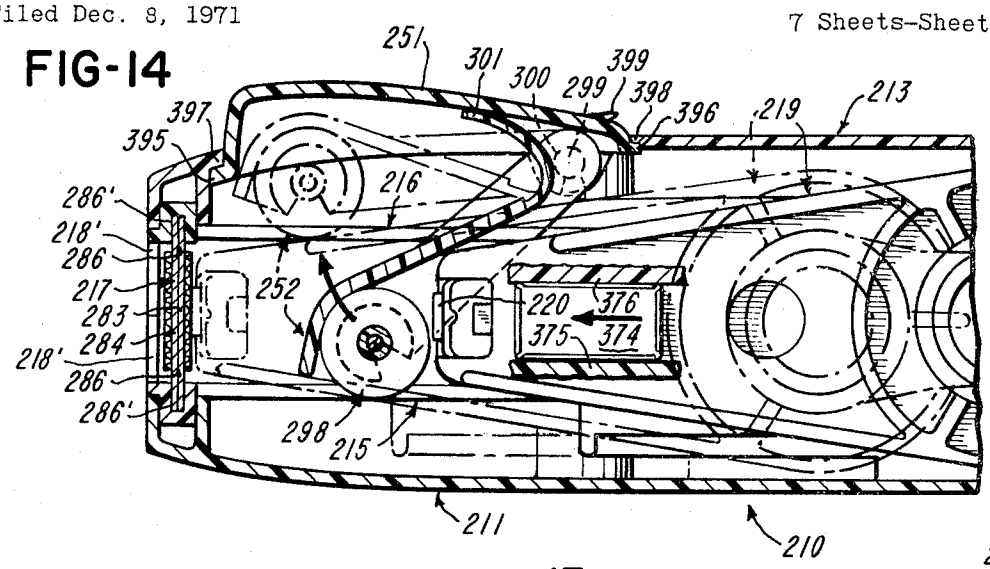
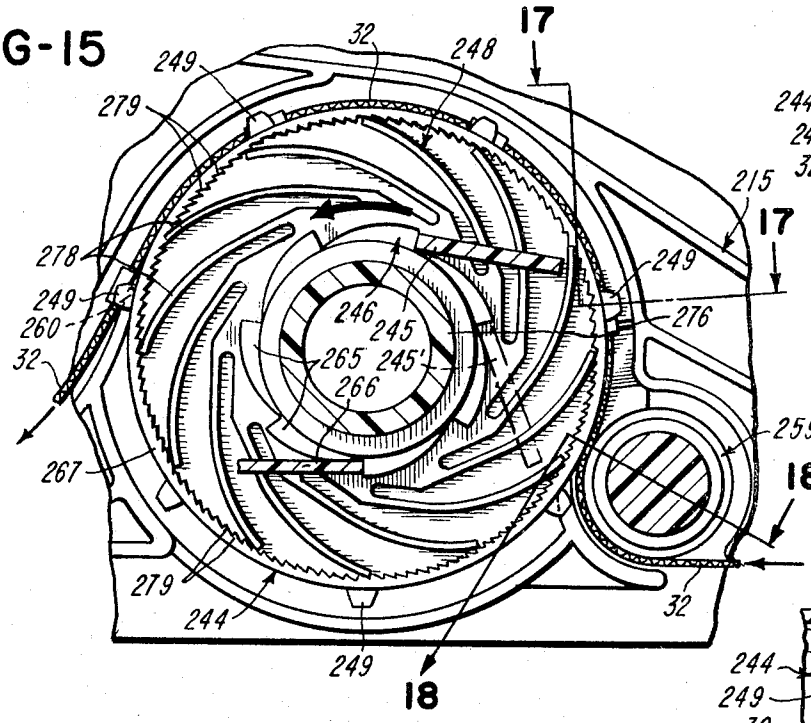


FIG-15



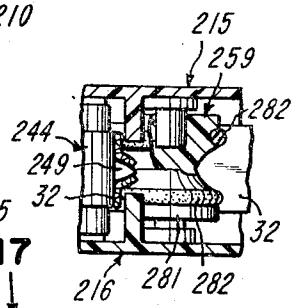


FIG-17

FIG-18

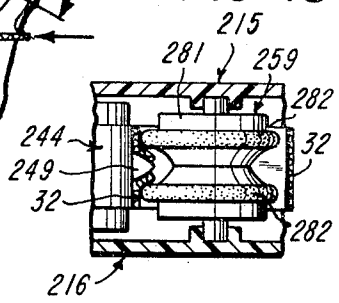
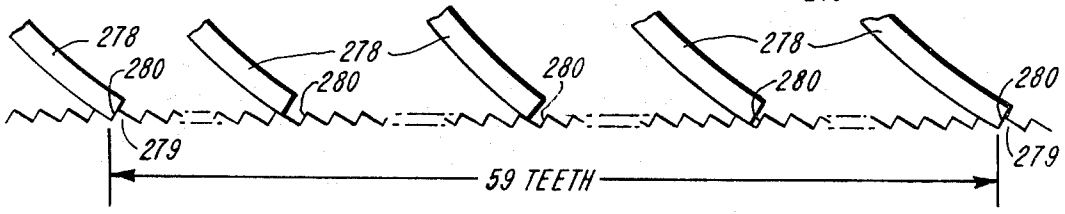


FIG-16



LABEL PRINTING AND APPLYING APPARATUS

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FIG-20

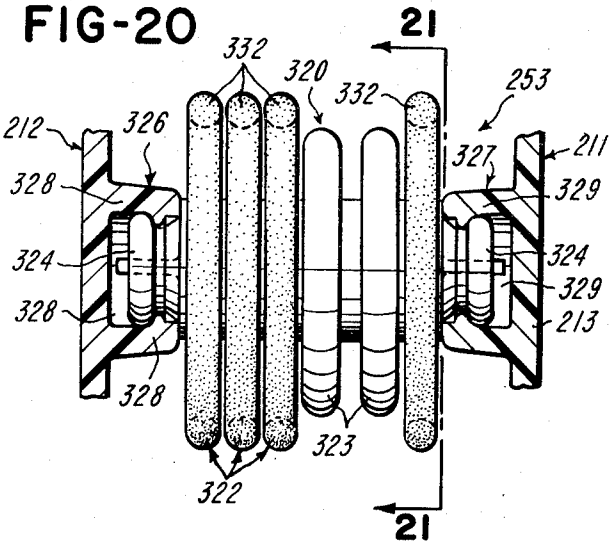


FIG-21

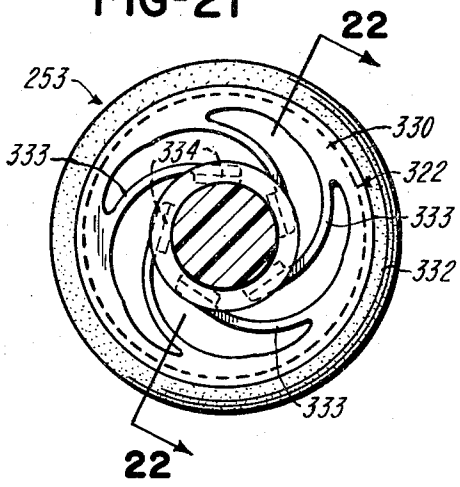
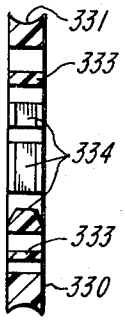


FIG-22



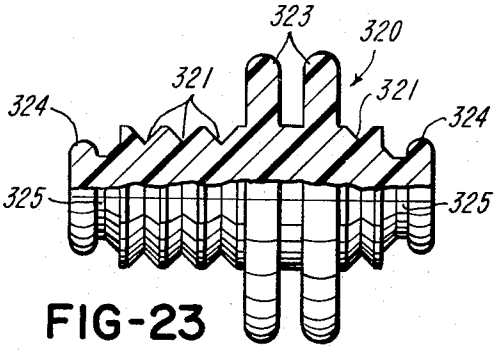


FIG-23

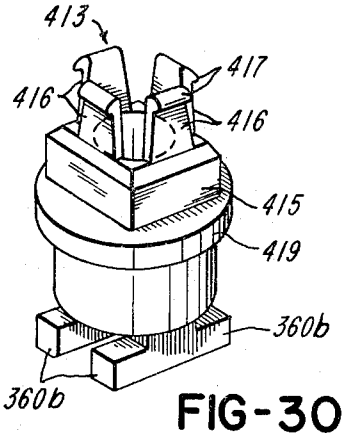
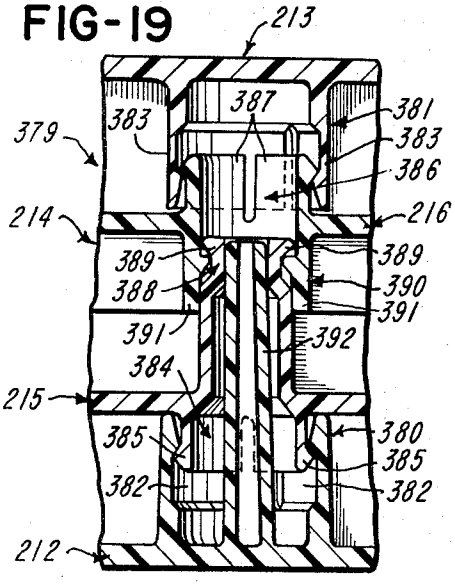


FIG-30

FIG-19



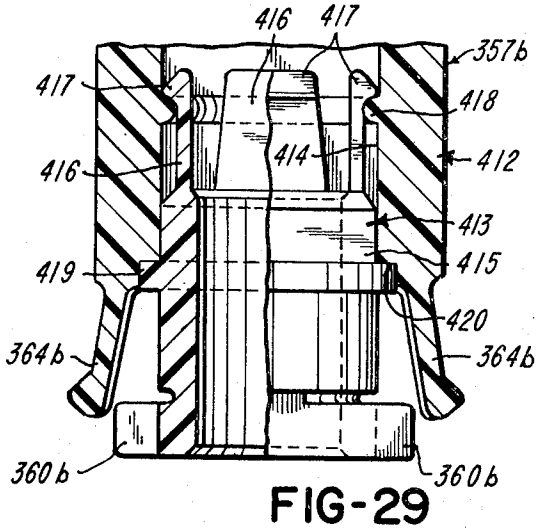


FIG-29

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LABEL PRINTING AND APPLYING APPARATUS

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FIG-24

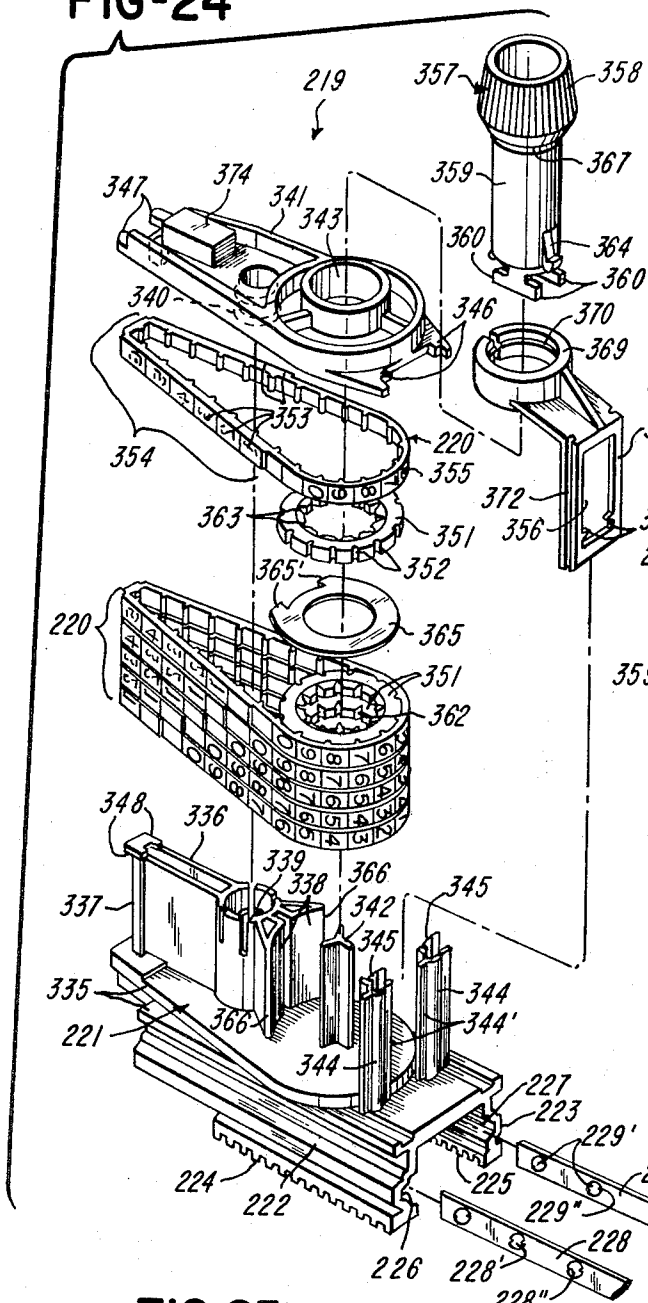
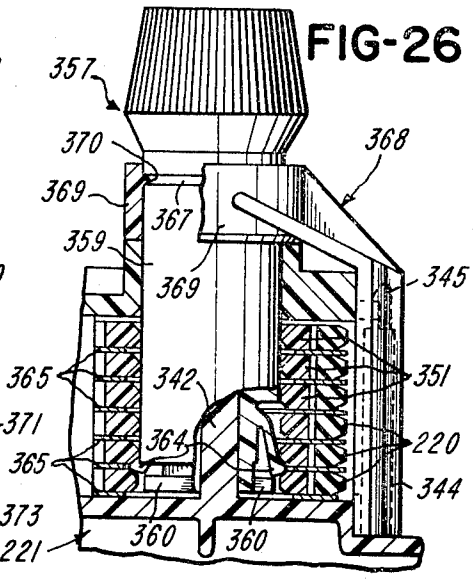


FIG-26



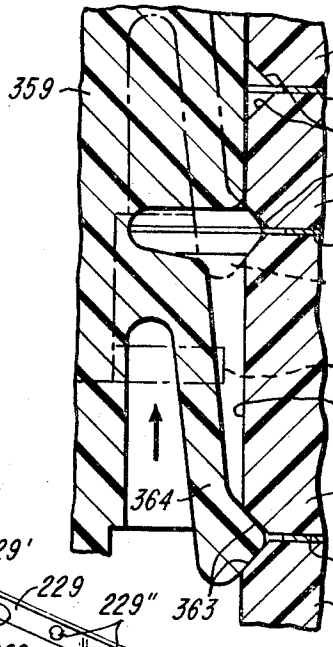
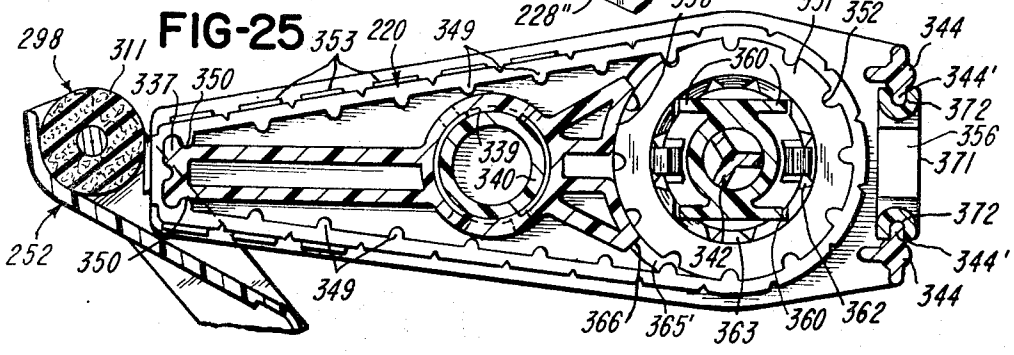


FIG-27

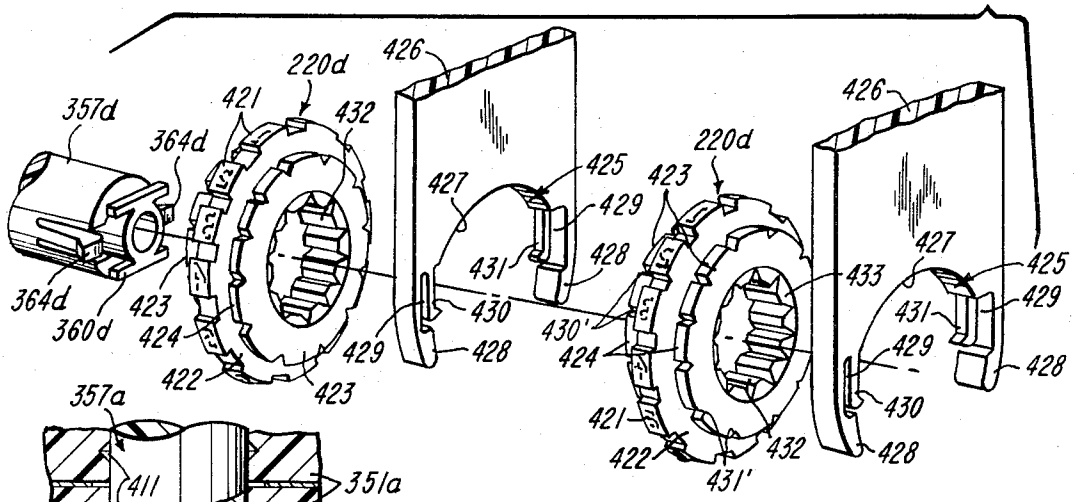
FIG-25



LABEL PRINTING AND APPLYING APPARATUS

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FIG-32



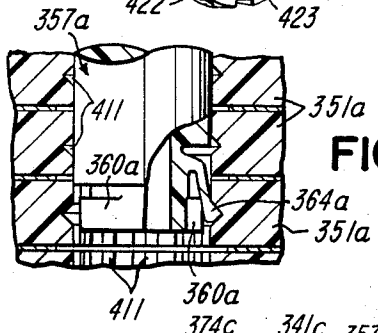


FIG-28

FIG-33

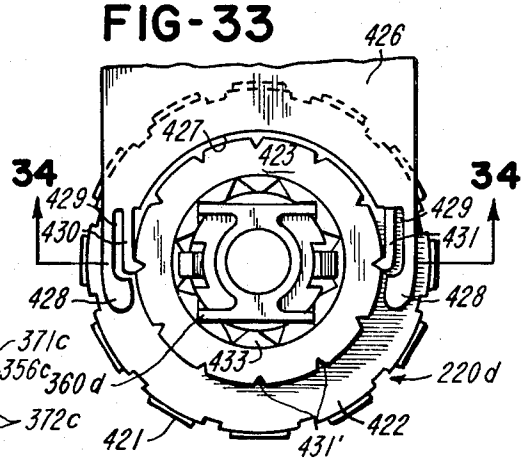


FIG-31

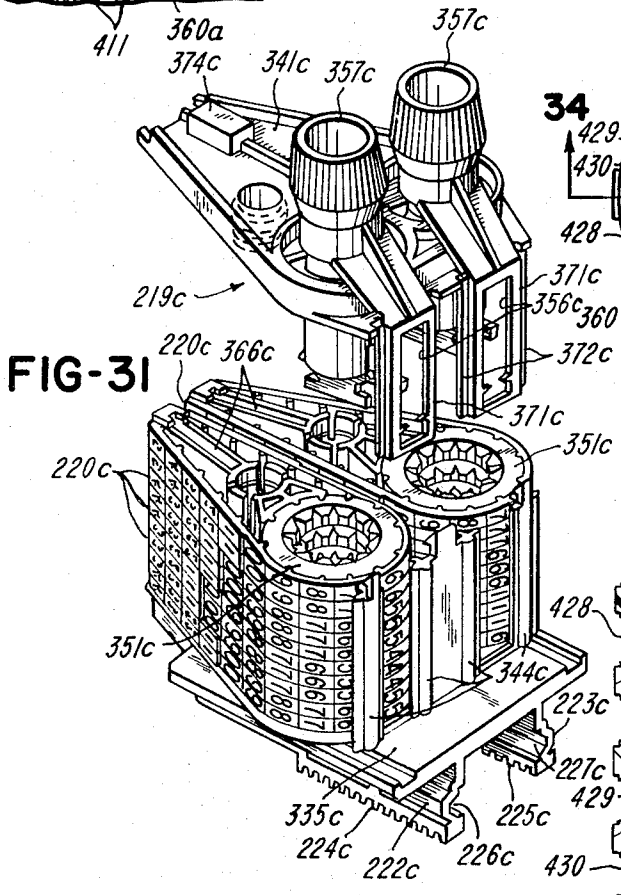
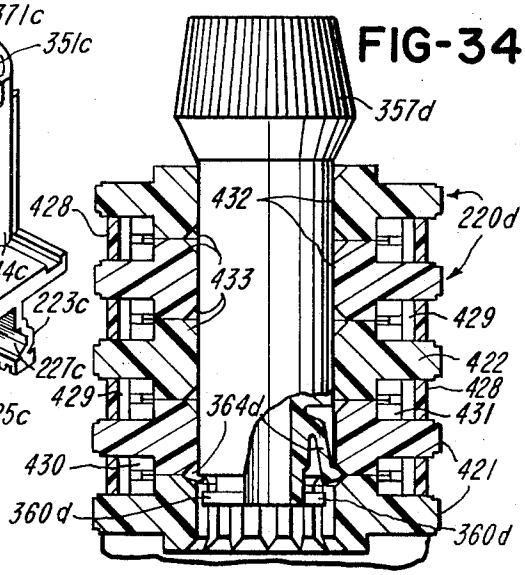


FIG-34



United States Patent Office 3,798,106 Patented Mar. 19, 1974

3,798,106

LABEL PRINTING AND APPLYING APPARATUS

William A. Jenkins, Englewood, and Paul H. Hamisch, Jr., Franklin, Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Dec. 8, 1971, Ser. No. 205,854
Int. Cl. B32b 31/00
U.S. Cl. 156—384 14 Claims

ABSTRACT OF THE DISCLOSURE

There is disclosed label printing and applying apparatus by which labels are successively printed and applied to merchandise. The apparatus feeds pressure sensitive labels mounted on a web of supporting material to a printing zone and to a delaminating zone. An applicator disposed downstream of the delaminating zone is used to apply the labels to merchandise.

CROSS-REFERENCE TO RELATED APPLICATIONS

Certain subject matter disclosed in the present application is claimed in copending U.S. application Ser. No. 206,061 filed Dec. 8, 1971 and copending U.S. application Ser. No. 208,035 filed Dec. 8, 1971 and which are assigned to the same assignee as the present application.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to the art of pressure sensitive labels, method and apparatus for making and using same, and label printing and applying machines.

Brief description of the prior art

Various U.S. Pats. Nos. 1,642,387, 2,259,358, 2,275,-064, 2,502,257, 2,516,487, 2,620,205, 2,656,063, 3,051,-353, 3,265,553, 3,343,485, 3,440,123, 3,501,365, 3,551,-251 and 611,929 and British Pat. No. 1,057,126, Feb. 1, 1967 are made of record.

SUMMARY OF THE INVENTION

The invention resides in label printing and applying apparatus, a specific embodiment of which is comprised of a pair of frame sections, a subframe disposed in the frame, and a print head mounted for movement by the subframe. A composite web of pressure sensitive labels is held by the subframe and composite web is paid out of the roll and guided to a printing zone and from there to a delaminating zone where one label at a time is delaminated from a web of supporting material. The supporting material form which the labels have been delaminated is engaged by a toothed feed wheel which cooperates with a die wheel to form feed holes in the supporting material. The formation of feed holes is facilitated by weakening the supporting material adjacent to but downstream of cuts which provide feed edges. As the teeth of the driver cooperate with the die wheel, the teeth rupture through the weakening in the supporting material and bring the labels into registration with the printing zone and the delaminating zone each time a manual operator is actuated. In order to maintain tension on the supporting material all the way from the supply roll to the toothed feed wheel, the structure by which the roll is mounted comprises not only means for providing a pair of hubs which extend into the label core, but also brake surfaces carried by the subframe engage only the ends of the label core and exert a braking force for preventing undesired rotation of the roll. Printing is effected by a print head movable into and out of printing cooperation relative to a platen. The print head has a pair of ball tracks. Each subframe section has an external ball track. A ball bearing

is received in one print head ball track and a respective subframe ball track and another ball bearing is received in the other print head ball track and the respective subframe ball track.

There are also provided various sets of snap-fit connections for holding the frame sections together. One set of these snap-fit connections provides a snap-fit connection between the frame sections. Another set provides a snap-fit connection between each frame section and the subframe and also between the subframe sections. Means are also provided for preventing the subframe section from being accidentally unsnapped while one of the frame sections is being unsnapped from the other frame section. By this arrangement the apparatus can be disassembled systematically without the accidental disassembly of those components which the user desires be maintained intact.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded perspective view of label printing and applying apparatus for carrying out the method of the invention;

FIG. 2 is a partly broken away top plan view of a composite web useful in the label printing and applying apparatus of the invention;

FIG. 3 is a sectional elevational view of the apparatus shown in FIG. 1;

FIG. 4 is a sectional view taken generally along line **4—4** of FIG. 3;

FIG. 5 is a sectional view taken along line **5—5** of FIG. 3;

FIG. 6 is a sectional view taken along line **6—6** of FIG. 3;

FIG. 7 is a side elevational view of one of the subframe sections of the apparatus;

FIG. 8 is a top plan view taken along line **8—8** of FIG. 7;

FIG. 9 is a side elevational view of the other subframe section;

FIG. 10 is a top plan view showing the manner in which the label core for the roll of labels is held and the manner in which braking force is applied by the subframe sections;

FIG. 11 is a sectional view taken along line **11—11** of FIG. 10;

FIG. 12 is a sectional view taken generally along line **12—12** of FIG. 3;

FIG. 13 is an exploded perspective view of the inking mechanism;

FIG. 14 is an enlarged sectional view showing a fragmentary portion of the apparatus in solid lines, and in particular showing a fragmentary portion of the print head and the inking mechanism in both solid and phantom line positions;

FIG. 15 is a sectional view taken along line **15—15** of FIG. 4;

FIG. 16 is a developed view showing the arrangement of the teeth of the detent mechanism;

FIG. 17 is a sectional view taken along line **17—17** of FIG. 15;

FIG. 18 is a sectional view taken generally along line **18—18** of FIG. 15;

FIG. 19 is a sectional view showing one of the three sets of snap-fit connections used to interconnect the frame and the subframe;

FIG. 20 is an enlarged view of an applicator roll shown mounted in the frame of the apparatus;

FIG. 21 is a sectional view taken along line **21—21** of FIG. 20;

FIG. 22 is a sectional view taken along line **22—22** of FIG. 21, but omitting the shaft and the frictional member;

FIG. 23 is a partly sectional view of the mounting shaft which forms part of the applicator roll;

FIG. 24 is an exploded perspective view of the print head;

FIG. 25 is a sectional view of the print head taken generally along line 25—25 of FIG. 3;

FIG. 26 is a sectional view showing the selector in relationship to the associated driven wheels;

FIG. 27 is an enlarged sectional view showing the manner in which detenting of the selector is effected, but showing the driven members as being of different widths;

FIG. 28 is a view similar to a fragmentary portion of FIG. 26, but showing the manner in which detenting can be effected directly on a wheel;

FIG. 29 is an enlarged, partly sectional, elevational view showing an alternative arrangement for constructing the selector;

FIG. 30 is a perspective view showing the driving member depicted in FIG. 29;

FIG. 31 is a partly exploded perspective view of a modified print head in accordance with the invention;

FIG. 32 is an exploded perspective view of the selector in association with type wheels and mounting structure for the type wheels;

FIG. 33 is an end elevational view of the type wheels and the selector assembled in the mounting members; and

FIG. 34 is a sectional view taken generally along line 34—34 of FIG. 33.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to a label printing and applying apparatus generally indicated at **210** in the embodiment of FIGS. 1 through 27, and initially to FIG. 1, there is shown to be a housing or main frame generally indicated at **211**. The housing or frame **211** is specifically shown to include a pair of frame sections **212** and **213**. Disposed within the housing **211** is a subframe generally indicated at **214** which comprises a pair of subframe sections **215** and **216**. The frame sections **212** and **213** mount a platen **217** which includes a peel edge **218**. A print head generally indicated at **219** is mounted by the subframe **214**. More specifically, the print head **219** includes a plurality of selectable settable printing members **220** in the form of endless printing bands mounted by a print head frame **221**. Extending from the frame **221** are a pair of flanges **222** and **223**. Gear sections or specifically racks **224** and **225** are provided at the ends of the respective flanges **222** and **223**. Opposed tracks **226** and **227** are formed on the respective flanges **222** and **223** to receive straight ball bearings **228** and **229**. The subframe sections **215** and **216** have respective tracks **230** and **231**. The ball bearing **228** is received in the track **226** of the flange **222** and in the track **230**, and the ball bearing **229** is received in the track **227** in the flange **223** and in the track **231**. The ball bearings **228** and **229** have respective balls **228'** and **229'** rotatably held by respective tangs or holders **228''** and **229''**. In this manner, the print head **219** is mounted for movement, particularly reciprocating movement, toward and away from the platen **217**.

The housing **211** has a handle generally indicated at **232** and particularly each housing or frame section **212** and **213** has a respective handle portion **233** and **234**. An operator generally indicated at **235** is shown to comprise a pivotally operated lever **236** pivotally mounted by a post **237** at the lower end of the handle **232**. The lever **236** is normally urged in a counterclockwise direction (FIG. 1) by a torsion spring **238** received about the post **237**. The pivotal movement of the lever **236** is limited by an adjustable stop block **239** received by the handle **232** between the handle portions **233** and **234**. The upper end of the operating lever **235** carries a pair of spaced-apart gear sections **240** and **241**. The gear sections **240** and **241** are shown to be in the form of spur gear segments. Gear sections **240** and **241** are in meshing engagement with respective spur gears **242** and **243**. The spur gears **242** and **243** are in meshing engagement with respective gear sections **224** and **225** carried by the print head **219**.

A roll of pressure sensitive labels, in the form for example of the composite web **30** shown in FIG. 2, is mounted by its core **44** by the sub-frame **214**. As will be described in greater detail hereinafter, the composite web **30** is drawn off the roll into overlying relationship with respect to the platen **217** and the supporting material **32** is engaged by a toothed driver **244**. The gear **243** carries an integral pawl **245** cooperable with a ratchet wheel **246** which is coupled to the driver **244** by a detent mechanism generally indicated at **247**. An input or drive member **248** of the detent mechanism **247** is shown in FIG. 1. The toothed driver **244** has a plurality of equally spaced apart drive teeth **249** arranged about its outer periphery. The pawl **245** is integrally joined at but one end to the gear **243**. The pawl **245** is flexible and resilient and can ride on the ratchet wheel **246** and deflect into engagement with a tooth **265** of the ratchet wheel **246**.

The housing or frame section **213** has an access opening **250**. A cover **251** is removably connected to the frame section **213** at the access opening **250**. The cover **251** mounts an inking mechanism **252** cooperable with the printing members **220** of the print head **219**. The housing sections **212** and **213** mount an applicator **253** disposed downstream of the peel edge **218**.

Referring to FIG. 2, there is shown composite web **30** of label material **31** releasably adhered to and carried by supporting or backing material **32**. The label material **31** is cut transversely by transverse cuts **33** extending all the way across the web **31** of label material to the side edges **34** and **35** of the composite web **30**. The cuts **33** known as "butt cuts" separate the web **31** of label material into a series of end-to-end labels **36**. The underside of the web **31** of label material has a coating of pressure sensitive adhesive **37** which adheres strongly to the web **31** of label material. The web **32** of supporting material carries a thin film or coating (not shown) which allows the labels to be peeled from the web **32** of supporting material.

Groups **38** of cuts are provided at equally spaced apart intervals along the length of the composite web **30**. Each group **38** of cuts is shown to extend through the supporting material as well as through the label material. Each group of cuts is shown to be made in a generally I-shaped configuration comprised of cuts **39S**, **40S** and **41S** in the supporting material and aligned cuts **39L**, **40L** and **41L** in the label material. The part of the web **32** between the one end of the cut **39S** and the cut **40S** provides a frangible portion **43S** and the part of the web **32** between the other end of the cut **39S** and the cut **41S** provides frangible portion **42S**. In like manner, the part of the label material between the end of the cut **39L** and the cut **40L** provides a frangible portion **43L** and the part between the other end of the cut **39L** and the cut **41L** provides a frangible portion **42L**.

Referring to FIG. 3, the interrelationship of the components of the apparatus **210** is shown in detail. The composite web **30** is paid out of the roll and passes through a passage provided by subframe sections **215** and **216** and specifically by groove **254** (FIG. 9) in the subframe section **215** and a cooperating groove **255** (FIGS. 1, 3 and 7) in the subframe section **216**. From there the composite web **30** passes partly around a roll **256** and into overlying relationship with the platen **217**. Delamination is effected at the peel edge **218** formed at the end of the platen **217**. The supporting material **32** is drawn around the peel edge **218** beneath the platen **217** and passes partly around a roll **257**, below the guide **258** and between the toothed driver **244** and the mating die wheel **259**. As a tooth **249** moves into mating cooperation with the die wheel **259**, the tooth **249** engages the supporting material **32** at the longitudinal cut **39S** and effects rupturing or bursting of the frangible portions **42S** and **43S**,

whereupon the tooth **249** which is in mating cooperation with the die wheel **259** (FIG. 18) is considered to have formed a feed hole in the supporting material **242**. It is preferred that there be three teeth **249** in driving engagement with the supporting material **32** at all times. The subframe sections **215** and **216** have respective aligned strippers **260** and **261** which facilitate disengagement of the teeth **249** with the supporting material **232** as the driver **244** rotates. Opposed guide grooves **262** and **263** formed in the subframe sections **215** and **216** guide the supporting material **32** to an exit opening **264**. Excess supporting material which dangles from the apparatus **210** can be readily torn off at the exit opening **264**.

With reference to FIG. 3, the print head **219** is shown by solid lines in the initial or home position and by phantom lines **219'** in the printing zone in printing cooperation with the label **36** and the platen **217**. The operator **235** is shown by solid lines in its initial or home position and in phantom lines **235'** in the fully actuated position. In the fully actuated position, the print head **219** has been moved into printing cooperation with the labels **36** and the platen **217**, and the operator **235** is in abutment with the stop block **239**. In this position of the operator **235**, the flexible resilient pawl **245** (FIG. 15), joined integrally at one end to the gear **243**, has moved to the position shown by phantom lines **245'** in driving cooperation with a tooth **265** of the ratchet wheel **246**. When the user releases the operator **235**, the spring **238** (FIG. 3) returns the operator **235** against stop **239'** to the solid line position shown in FIG. 3. While the operator **235** is returning to the solid line position from the fully actuated position indicated by phantom lines **235'**, the gear sections **240** and **241** (FIGS. 3 and 4) rotate gears **242** and **243** clockwise (FIG. 3) to return the print head **219** to the solid line position from the position shown by phantom lines **219'** and to drive the pawl **245** from the position shown by phantom lines **245'** to the position shown in solid lines in FIG. 15. Thus, the pawl **245**, which is in engagement with a tooth **265**, drives the ratchet wheel **246** counterclockwise (FIG. 15). This counterclockwise rotation of the ratchet wheel **246** (FIG. 15) causes the driver **244** to advance the supporting material **32** to effect substantially complete delamination of a label at the peel edge **218**. Counterclockwise rotation of the ratchet wheel **246** continues until a pawl **266** (FIGS. 1, 7 and 15) in the form of a flexible resilient appendage of the subframe section **216**, moves into engagement with a tooth **265** of the ratchet wheel. This prevents the web of supporting material **32** from being accidentally moved in the return direction.

As best shown in FIG. 4, the driver **244** has an annular rim **267** joined to a hub **268** by a radial web **269**. The hub **268** has a hub section **268'** extending in one direction and another hub section **268"** extending in the opposite direction. The hub section **268'** terminates at a knob **270**, and the hub section **268"** terminates at a knob **270'**. The gear **242** is rotatably journaled on and with respect to the hub section **268'**. The gear **242** has a hub or flange **271** which is rotatably journaled in opening **272** in the frame section **212**. The hub section **268'** extends through an enlarged opening **273** in the subframe section **215**. The hub section **268"** provides a stepped pair of bearing surfaces **274**. The ratchet wheel **246** is formed integrally with the drive member **248** of the detent mechanism **247**. The ratchet wheel **246** and the drive member **248** have a hub **276** with a stepped bore **275** into which the hub section **268"** extends. A hub **276** rotatably receives and mounts the gear **243**. The gear **243** has a hub **277** rotatably received in a bearing **278** formed integrally with the housing section **213**. As seen in FIG. 4, the gears **242** and **243** are in driving engagement with respective gear sections **224** and **225** carried by the print head **219**; the relative position of the drive pawl **245** to the ratchet wheel **246** is also shown.

With reference to FIG. 15, the drive member **248** includes a plurality of spring fingers or detent pawls **278**. The pawls **278** are of equal length, are flexible and resilient, and are continuously urged against teeth **279** formed on the inside of the annular rim **267**. In the illustrated embodiment there are one hundred and seventy-seven teeth **279** at equally spaced-apart intervals. There are twelve pawls **278** integrally connected to the hub **276** at equally spaced-apart intervals. The teeth **279** comprise respective tooth faces **280** and a recess between adjacent tooth faces **280** in which the end of a pawl **278** can be received. The pawls **278** drive the feed wheel **244** in a driving direction (counterclockwise in FIG. 15) but can move in a non-driving direction (clockwise in FIG. 15) relative to the feed wheel **244** by manually operating the detent mechanism **247**. Accordingly, every fifth pawl **278** is engaged with the face **280** of a tooth **279**. The pawls **278** between every fifth set of pawls are out of engagement with their respective tooth faces **280** by different increments as best illustrated in FIG. 16. Normally, the pawls **278** hold the ratchet wheel **246** and the feed wheel or driver **244** in fixed relationship with respect to each other. With reference to FIG. 15, as the drive pawl **245** moves counterclockwise the ratchet wheel **246** is driven counterclockwise and the three pawls **278** which are in driving engagement with their respective tooth faces **280** will drive the feed wheel **244** counterclockwise. Accordingly, there is no relative rotation between the ratchet wheel **246** and the feed wheel **244**. Should it be desired to change the position to which the labels are advanced by the feed wheel **244** upon actuation of the operator **235**, the user will grasp the knobs **270** and **270'** and will rotate the knob **270'** counterclockwise (FIG. 1) relative to the knob **270**. This will cause the input member **248** to rotate (counterclockwise in FIG. 1, clockwise in FIG. 15) relative to the feed wheel **244** so that the next three successive teeth move into engagement with the next three respective tooth faces **280**. For example, if it is considered that first, fifth and ninth pawls **278** were intially in engagement with respective teeth **279**, only a very slight rotation will cause second, sixth and tenth pawls to move into engagement with their respective tooth faces **280**, and so on. Although any desired number of pawls **278** and teeth **280** can be used, the illustrated embodiment provides very minute adjustment of the feed wheel **244** relative to the platen **217** and the peel edge **218** and the arrangement of teeth **280** and cooperating pawls **278** causes the entire input or drive member **248** to be centered within the annular rim **267**. With respect to the printing function, adjustment of the detent mechanism **247** changes the position relative to the printing zone between the print head **219** and the platen **217** to which a label **36** is advanced. With respect to the delaminating function, operation of the detent mechanism **247** also changes the position to which the label **36** is advanced. accordingly, it is apparent that the detent mechanism **247** is useful both in establishing the position to which a label is advanced relative to the printing zone and to the delaminating zone. It is important that just the correct amount of trailing marginal end edge of the label remain adhered to the peel edge so that the label **36** is held in that position until it is ready to be applied to merchandise by the applicator **253**.

As best shown in FIGS. 15, 17, and 18, the supporting material **32** is initially brought into engagement with the feed wheel **244** as it passes around the die wheel **259**. The die wheel **259** is comprised of an annular plastic roll **281** journaled by subframe sections **215** and **216**. The roll **281** has frictional members in the form of rubber O-rings **282** received at spaced-apart locations about the periphery of the roll **281**. The O-rings straddle the teeth **249** and are just spaced apart far enough to act as a die wheel with mating teeth **249**. As a tooth **249** begins to engage the web of supporting material **32** at the cut **39S** (FIG. 2), the die wheel **259** cooperates with the tooth **249** to hold the supporting material **32** on each side of the group **38** of cuts in intimate contact with the outer surface of the

feed wheel 244 as best shown in FIG. 18. This insures that the tooth 249 properly bursts or forms a hole, facilitated by the group 38 of cuts, in the supporting material 32 and that the drive face of the tooth 249 is in driving engagement with the leading cut 41S. When the first tooth 249 registers with the group 38 of cuts in the supporting material 32 the composite web 30 is properly registered with the printing zone and the delaminating zone. Once such registration is accomplished as the result of the tooth 249 cooperating with the die roll 259, correct registration continues.

The platen 217 and the peel edge 218 (FIGS. 1 and 3) are formed from an inversely-bent plate having a pair of side-by-side plate portions 283 and 284 joined by an inversely-bent portion 285. The inversely-bent portion 285 has a small radius and defines the peel edge 218. The plate portions 283 and 284 are co-extensive and are secured to each other by weldments 286. The plate which forms the platen 217 and the peel edge 218, received in recesses 286' in subframe sections 215 and 216, is preferably constructed of highly polished stainless steel. The sides of the plate that forms the platen 217 and the peel edge 218 are received in opposed recesses 286' in the subframe sections 215 and 216. A label stopper is provided by a pair of aligned plates 218' formed integrally with the subframe sections 215 and 216. The plates 218' are disposed beneath but are spaced from the plate 217. Should a label 36 attempt to fall onto the supporting material 32 after being delaminated at the peel edge 218, the labels 36 will be caught by the plates 218'. This will prevent any label 36 from continuing along the path through which the supporting material 32 passes after passing the peel edge 218.

With reference to FIG. 3, the stop block 239 is shown to be slidable on a stop surface 287. The stop block 239 has a threaded bore 288 which threadably receives an adjusted screw 289. One half of the screw 289 is rotatably received in a semi-circular groove 290 and one-half of the head 291 of the screw 289 is captive in a semi-circular recess 292 in the seat 293. The handle portion 233 of the frame section 212 provides another stop surface (not shown) for the stop block 239 in alignment with the stop surface 287, another semi-circular groove (not shown) opposite the groove 290 for receiving the other one-half of the screw 289, and another semicircular recess (not shown) opposite the recess 292 for receiving the other one-half of the head 291. A hole 294, one-half of which is formed by each handle portion 233 and 234, enables entry of a tool (not shown) by which the head 291 of the screw 289 can be engaged to rotate the screw 289. Rotation of the screw in one direction will cause the stop block 239 to move upwardly (FIG. 3) and rotation of the screw 289 in the opposite direction will cause the stop block 239 to move downwardly (FIG. 3). It is apparent that adjustment of the position of the stop block 239 will adjust the limit of the travel of the operator 235.

With reference to FIG. 13, the inking mechanism 252 is shown to comprise a one-piece inker body 295 having an aligned pair of sockets 296 having converging openings 297. The sockets 296 extend for more than 180° so that the ink roll 298 can be snapped into the sockets 296. The inker body 295 has a pair of aligned projections 299 which are capable of being snapped into sockets 300 (FIG. 1) in the cover 251. The sockets 300 are shaped like the sockets 296. The inker body 295 has an integrally formed leaf spring or spring finger 301 which is shown in FIG. 14 to be urged against the cover 251. The spring finger 301 normally urges the inking mechanism 252 into the solid line position shown in FIG. 14. The ink roller 298 is shown in FIG. 14 to be in the path of but slightly spaced from the print head 219 because in that position the inker body 295 contacts the frame 221 of the print head 219. When the print head 219 is moved from the solid line position to the phantom line position, the ink roll 298 applies ink to the printing bands 220 and the entire inking mechanism 252 pivots about projections 299 to the position shown in phantom lines. When the print head 219 returns to the solid line position shown in FIG. 14, the spring finger 301 returns the inking mechanism 252 to the solid line position.

With reference to FIG. 13, the ink roller 298 is shown to comprise a pair of hub section 302 and 303. The hub section 302 has an elongated projection 304 at one end and a stub end 305 at its opposite end. The hub section 302 has an annular flange 306 between the stub end 305 and a reduced portion 307. The reduced portion 307 is disposed between the flange 306 and the projection 304. The other hub portion 303 has an annular flange 308 disposed between a reduced portion 309 and a stub end 310. The reduced portion 309 has a bore 304' into which the projection 304 is adapted to be pressfitted. The projection 304 has straight flutes which serve to lock the hub portions 302 and 303 together. An ink-receptive tubular porous roll 311, composed for example of rubber or the like, is received on the reduced portions 307 and 309 of respective hub sections 302 and 303. The flanges 306 and 308 abut the ends of the roll 311 and prevent the roll 311 from shifting.

With reference to FIGS. 7, 8 and 9, the subframe sections 215 and 216 are shown to have respective integral leaf springs 312 and 313. The leaf springs 312 and 313 are provided with integral annular brake members 314 and 315 having respective annular brake surfaces 316 and 317. Brake members 314 and 315 are formed integrally with projections or hubs 318 and 319, surfaces 318' and 319' of which are received in and mount label core 44. The brake surfaces 316 and 317 cooperate to exert braking forces on the label core 44. Neither the hubs 318 and 319 nor the brake members 314 and 315 contact the composite web 30 which is wound on the label core 44. In this manner, any gum or adhesive that may exist at the marginal side edges of the composite web 30 will not be transferred to the brake surfaces 316 and 317. FIG. 10 illustrates, in exaggerated form, by phantom lines, the initial positions of the leaf springs 312 and 313, the brake members 314 and 315 and the hubs 318 and 319. The initial canted position of the leaf springs 313, the brake members 315 and the hub 319 relative to the remainder of the subframe section 216 is also shown in FIG. 8. Insertion of the label core 44 onto the hubs 318 and 319 will cause the leaf springs 312 and 313 to flex outwardly and the brake surfaces 316 and 317 will exert a predetermined braking force on the ends of the core 44. The braking force applied to the core 44 will insure that there is tension in the web 32 of supporting material from the label roll to the printing zone, to the peel edge 218, and to the toothed driver 244. As the pawl 266 (FIG. 15) prevents the reverse rotation of the driver 244, it is seen that the apparatus maintains a slight but desirable amount of tension on the web of supporting material 32 at all times.

The frame 211 comprises an essentially closed shell but the rear part provides an access opening 211' through which a roll of labels can be inserted and a spent core 44 can be removed without even partial disassembly of the apparatus 210.

With reference to FIGS. 20 through 23, there is shown the applicator 253 mounted by the frame 211. The applicator 253 comprises a hub 320 shown to have four annular generally V-shaped grooves 321 in which respective wheels 322 are rotatably mounted. The hub 320 also has a pair of annular flanges 323 disposed between the set of three wheels 322 and the remaining wheel 322. The wheels 322 have greater diameters than the flanges 323. The ends of the hub 320 beyond the grooves 321 are stub ends 324. Undercuts 325 inboard of the stub ends 324 enable the hub to be retained in cooperating yieldable sockets 326 and 327 in frame sections 212 and 213. The sockets 326 and 327 are comprised of a plurality of separate socket sections or flexible resilient fingers 328 and

329 to enable the stub ends 324 to be snapped into place. The sockets 326 and 327 and the cooperating stub ends 324 provide opposed snap-fit connections.

The wheels 322 are identical so only one is described in detail. Each wheel 322 is comprised of an annular rim 330 having an annular groove 331 in its outer pehiphery. A rubber O-ring 332 is received in the groove 331. A plurality of equally spaced-apart arms 333 formed integrally with the rim 330 have generally V-shaped bearing sections 334 received in the respective groove 321. The bearing sections 334 of the arms 333 exert forces against the hub 320, but enable the wheel 322 to rotate relative to the hub 320 and enable the wheel 322 to yield as a label 36 is being applied to the merchandise.

As the rubber O-rings 332 have a high coefficient of friction, rotation of the wheels 322 during label application is facilitated. The spacing of the wheels 322 allows the applicator 253 to press the label 36 onto the merchandise without contacting the printing which was applied to the labels 36 by the print head 219. As the label is pressed onto the merchandise, the arms 333 allow the wheels to yield. This yielding action is particularly useful when applying labels to merchandise having irregular surfaces in that the wheels 322 are mounted for both independent rotational and independent yielding movements with respect to each other. The flanges 323 prevent the adjacent wheels 322 from deflecting more than a small amount away from the perpendicular with respect to the hub 320.

Referring to FIG. 24, there is shown an exploded view of the print head 219. The print head frame 221 is shown to comprise a side plate 335 to which the flanges 222 and 223 are joined. A mounting block 336 is molded integrally with the side plate 335. The block 336 has a platen or pressure member 337 and arcuate mounting surfaces 338. The mounting block 336 also has a socket 339 for receiving a projection 340 of the other side plate 341. A post 342 is formed integrally with the side plate 335 in axial alignment with a hole 343 in the side plate 341. A pair of posts 344 formed formed integrally with the side plate 335 have hooks 345 which engage shoulders 346 of the side plate 341. The side plate 341 has projections 347 which are adapted to fit under projections 348 on the block 336. When the projections 347 are positioned underneath the proejctions 348, that is, between the projections 348 and the side plate 335, the projection 340 is received in the socket 339, and when the hooks 345 are in engagement with shoulders 346, then the frame 221 is securely but releasably locked together.

The printing bands 220 are mounted in the frame 221 as best shown in FIG. 25. The printing bands 220 are urged against the support or pressure member 337 and are detented because teeth 349 formed on the understide of each of the printing bands 220 are in engagement with notches 350 formed on the side of the support 337. In this position, the projection 340 is shown received in the socket 339, the printing bands are trained partially around driven members in the form of wheels 351, the printing bands 220 are under slight tension, and the wheels are cradled in and rotatable on the mounting surfaces 338. The wheels 351 have notches 352 in which the teeth 349 are received.

Each printing band 220 has a plurality of printing blocks 353. The different printing blocks 353 of each printing band 220 can print different data, as in conventional. The printing blocks 353 are contained in a printing section 354 of the printing band 220. The printing band 220 also contains a non-printing human readable section 355. The human readable section 355 contains human readable indicia. The user knows what data the printing block 353 at the pressure member 337 will print by peering through a window 356.

It is often desirable to change the data which the print head 219 is to print. This is generally accomplished by advancing the printing band 220 to the printing position in which the selected data will be printed on the label. A selector, generally indicated at 357, has a knob 358 and a shaft or tubular portion 359 received by the post 342. The selector 357 is freely rotatable about the post 342 and is movable axially so that its driving members or lugs 360 can be shifted into driving cooperation with any one of the driven members 351. Each driven member 351 has a central hole 361 which is provided with a plurality of notches 362 for receiving respective lugs 360. Each driven member 351 is also chamfered at the central hole 361 as best indicated at 363. In addition to the driving lugs 360, the selector 357 is shown to have a pair of opposed pawls or spring detent fingers 364, the ends of which engage the recesses provided by the chamfering 363. The detent fingers 364 serve to hold the selector 357 in the axial position to which it is manually shifted, but enable the selector 357 to be shifted to any desired position so that its driving members 360 will be in driving engagement with the selected driven member 351. Accordingly, by shifting the selector 357, any one or all of the driven members 351 can be rotated, one at a time, which results in the respective printing bands or hands 220 being selectively moved to the selected position to print the selected data on the labels.

The driving lugs 360 are spaced slightly from the ends of the recesses or notches 362. Should the user attempt to turn the knob 358 so as to apply excessive torque to the selector 357, the driving lugs 360 will deflect and move out of the set of notches 362 in which they are positioned in the driven member 351 and will move into the next set of notches 362 in the same driven member 351. Accordingly, there will be relative rotation between the selector 357 and the driven member 351 in which the lugs 360 are received.

There is a spacer 365 between each of the driven members 351 and bands 220. Each of the spacers 365 has a pair of lugs 365' which engage around the ends 366 at the ends of the mounting surface 338.

The selector 357 is provided with an annular groove 367 adjacent the knob 358. An indicator, generally indicated at 368, has a split collar 369 with a projection 370 received in the groove 367. The indicator 368 has a rectangular section 371 which defines the window 356. The posts 344 have tongues or guides 344' which are in engagement in grooves 372 in the rectangular section 371. A pair of pointers 373 disposed on the inner surface of the rectangular section 371 are in alignment with the lugs 360 on the selector 357. Accordingly, the pointers 373 indicate the position of the lugs 360 so that if the selector 357 is not in position to drive the desired driven member 351 and its associated printing band 220, the selector 357 can be shifted to a position in which the lugs 360 are ing driving engagement with the desired driven member 351 to advance the associated printing band 220 to the selected position.

As shown in FIG. 24, the side plate 341 has a projection or lug 374 by which the printing head 219 is guided by the frame sections 212 and 213 by respective guides 375 and 376 (see FIGS. 1, 3, 14).

The housing or frame sections 212 and 213 are connected by identical snap-fit connections including generally snap shaped flexible resilient members 377 arranged along the periphery of the housing section 212 and engaged in undercut recesses 378 in the housing section 213. One of these snap-fit connections is shown in detail in FIG. 5.

The subframe sections 215 and 216 of the subframe 214 are connected to each other and the frame sections 212 and 213 of the frame 211 are connected to the subframe 214 by means of three sets of identical snap-fit connections generally indicated at 379, one of which is shown in detail in FIG. 19. With reference to FIG. 19, the frame sections 212 and 213 have respective sockets 380 and 381 comprised of a plurality of respective flexible resilient fingers 382 and 383. The subframe section 215

has a projection **384** snap-fitted into the socket **380**. The projection **384** has a plurality of flexible resilient spring fingers **385**. The subframe section **216** has a projection **386** comprised of a plurality of flexible resilient fingers **387** snap-fitted into the socket **381**. The subframe section **215** has a projection **388** comprised of a plurality of flexible resilient spring fingers **389** received in a socket **390**. The socket **390** is comprised of flexible resilient spring fingers **391**. A projection **392** formed integrally with the frame section **212** extends through the socket **380**, through the projection **384**, and to about the end of the projection **388** in the socket **390**. The spring fingers **383** of the socket **381** are made thinner and consequently more flexible than the spring fingers **382** of the socket **380**. An attempt to open up the frame **211** by separating the frame sections **212** and **213** will cause the frame section **213** to be separated from the sub-frame section **216**. The frame section **212** will remain connected to the subframe **214**. As the frame section **213** is being separated from the subframe **214**, the projection **392** prevents the subframe sections **215** and **216** from separating because the spring fingers **389** cannot deflect inwardly because of the interference provided by the projection **392**. Once the frame section **213** has been removed, the inside of the apparatus **210** is exposed. It is apparent that accidental unsnapping of the subframe **214** or the frame section **212** from the subrame **214** is obviated by this construction. Further disassembly can be accomplished by deliberately unsnapping the subframe **214** from the frame section **212**. This is accomplished by moving the projection **384** out of the socket **380**. When this has been accomplished, the projection **392** has moved out of the space between the spring fingers **389** of the projection **388** and consequently the subframe sections **215** and **216** can be separated.

With reference to FIGS. 7 through 9 for example, the subframe section **216** is shown to have four projections **393** which are adapted to be snugly received in recesses **394** at the end of the guide **262**. The projections **393** received in the holes **394** assist in removably holding the subframe sections **215** and **216** together.

With reference to FIGS. 1 and 14 the cover **251** is shown to have an L-shaped flange **395** at one end and a projection **396** at its other end. To attach the inking mechanism **252** to the apparatus, the projection **395** is pushed under a shoulder **397** of the frame section **213** and thereafter the cover **251** is snapped into position by causing the projection **396** to snap under a lip **398** of the frame section **213**. In this manner, the inking mechanism or inker **252** is removably mounted to the apparatus. To remove the inking mechanism, the user can engage his fingernail beneath an extension **399** of the cover **251**, thereby causing the projection **396** to snap around the lip **398**.

With reference to FIG. 6, the operater **235** is shown to pivot on the pin **237**. It is preferred to pivot the operator **235** at the lower end of the handle **232** in that the user's strongest fingers, namely his index, middle and ring fingers engage the operator **235** at substantial distances from the pivot pin **237**, while the user's relatively weak little finger is close to the pivot pin **237**. The ends of the pin **237** are undercut as indicated respectively at **403** and **404**. The ends **401** and **402** are received in sockets **405** and **406** in respective frame sections **212** and **213**. The sockets **405** and **406** are compirsed of respective flexible resilient fingers **407** and **408**. The operator **235**, as best shown in FIGS. 3 and 4, is shown to be generally U-shaped in section. Legs **409** and **410** are shown to be rotatably received about the pin **237**. The spiral or torsion spring **238** is shown to be received on pin **237** between the legs **409** and **410**. If it is desired to remove the frame section **213**, the frame section **213** is moved relatively away from the frame section **212** causing the socket **406** to move out of snap-fit engagement with the end **402**. Only when the operator **235** is moved away from the frame section **212** can the end **401** move out of the socket **405** because of interference caused by leg **409**. This construction obviates accidental disconnection of the pin **237** from the frame sections **212**.

With reference to FIG. 28, there is shown an alternative construction by which a selector **357*a*** having a plurality of driving lugs **360*a*** like the lugs **360** and also having a pair of opposed pawls **364*a***, selectively controls the setting of a selected driven member or wheel **351*a***. The embodiment of FIG. 28 differs from the embodiment of the print head **219** shown for example in FIGS. 24 through **27** in that each of the driven members **351*a*** is provided with an internal annular groove **411** and the chamfering **363** (FIG. 27) is omitted. Accordingly, instead of having the pawl **364*a*** engage between adjacent driven members **351** as shown in FIGS. 26 and 27 for example, the pawls **364*a*** engage in the groove **411** of one of the driven members **351*a***, and as is preferred in the groove **411** of the same wheel with which the lugs **360*a*** are in driving engagement. By this construction, the driving function as well as the detenting function are accomplished by the selector **357*a*** in cooperation with a single driven member **351*a***.

FIG. 27 is actually an alternative embodiment which shows the detenting of one of the pawls **364** in recesses or grooves provided by beveling or chamfering **363**. FIG. 27 shows one of the wheels **351** as wider than the adjacent wheel **351** to show that the selector **357** in accordance with the invention can work equally well with wheels **351** of different sizes without affecting detenting. With such a construction some of the printing bands **220** can be wider than others as is highly desirable in some applications.

With reference to FIGS. 29 and 30, there is shown another embodiment of a selector generally indicated at **357*b***. The selector **357*b*** is the same as the selector **357** in that it has four drive lugs **360*b***, and a pair of opposed pawls **364*b***. The selector **357*b*** differs from the selector **357** only in that the selector **357** is of one-piece construction and the selector **357*b*** is of two-piece construction. The selector **357*b*** comprises body sections **412** and **413** snap-fitted together. The body section **412** has a non-circular hole, and in particular a square hole **414**, and the body section **413** has a corresponding square portion **415** received in the hole **414**. By this construction, the body sections **412** and **413** are incapable of rotating relative to each other. The body section **413** has four flexible resilient fingers **416** terminating at projections **417** shown in FIG. 29 to be received over a bead **418**. In this position, an annular flange **419** is in abutment with a shoulder **420** on the body section **412**. The selector **357*b*** is used in the same manner as the selector **357**. If desired, the selector **357*a*** (FIG. 28) can be made in two parts as illustrated in FIGS. 29 and 30.

Referring to the embodiment of FIGS. 31, there is shown a print head generally indicated at **219*c*** having two spaced-apart sets of printing members **220*c***. The print head **219*c*** has two sets of mounting blocks **366c**, two sets of driven members **351*c*** and posts **344*c***, all formed integrally with side plate **335*c***. Flanges **222*c*** and **223*c*** and gear sections **224*c*** and **225*c*** are spaced apart wider than the flanges **222** and **223** and gear sections **224** and **225**. Accordingly, the pair of gears (not shown) which would mesh with gear sections **224*c*** and **225*c*** would have to be spaced apart by a greater distance than the gears **242** and **243**. It is also apparent that ball tracks (not shown) which would correspond to the ball tracks **230** and **231** would have to be spaced wider apart, as would be readily apparent to one skilled in the art. Side plate **341*c*** carries a guide member **374*c***. The side plate **341*c*** rotatably mounts a pair of selectors **357*c*** for the respective set of driven members **351*c***. The posts **344*c*** mount respective rectangular sections **371*c*** which provide respective windows **356*c***. It is readily apparent that with slight modifications the print head **219*c*** can be operated by a mechanism the

same in principle and construction as the mechanism which operates the print head **219**.

Referring to the embodiment of FIGS. 32, 33 and 34, there is provided a selector **357***d* which is identical to the selector **357**. Printing members take the form of print wheels **220***d*. Each print wheel **220***d* is shown to be identical and comprises printing elements **421** carried by an annular hub **422**. A mounting and detenting wheel **423** is shown to be formed integrally with each side of the hub **422**. The wheels **423** have generally annular outer surfaces **424** received in sockets **425** of adjacent mounting members **426**. The sockets **425** comprise an annular portion **427** and a pair of flexible resilient arms **428** formed integrally therewith. Accordingly, the print wheels **220***d* can be inserted either axially into the sockets **425** or they can be inserted into or removed from the respective sockets **425** by spreading arms **428**. Mounting members **426** are provided with recesses **429** in which offset integrally formed detent pawls or spring fingers **430** and **431** are disposed. The pawl **430** of the mounting member **426** is cooperable with notches **430'** to effect detenting of an adjacent print wheel **220***d* on one side of the mounting member **426**, and the other is cooperable with notches **431'** to effect detenting of the adjacent print wheel **220***d* on the other side of the mounting member **426**.

Each wheel **220***d* has a central hole **432**, the ends of which are chamfered as indicated at **433**. As best shown in FIG. 34, pawls **364***d* are received in the chamfering between adjacent wheels **220***d* and drive lugs **360***d* are in driving engagement with the adjacent print wheel **220***d*. If desired, detenting can be effected in the manner illustrated in the embodiment of FIG. 28.

It is preferred to mold the driver or feed wheel **244** of a material which incorporates a lubricant to diminish the amount of gum or adhesive that is transferred to the feed wheel **244** during use to prevent improper feeding. By incorporating the lubricant in the feed wheel **244** the surface of the feed wheel **244** has a low coefficient of friction. However, the teeth **249** are adequate to grip and drive the web **32**. One specific material to be used to mold the feed wheel is an acetal resin combined with polytetrafluoroethylene lubricants. One such material is sold commercially under the name Thermocomp, Number KL–4030 by Liquid Nitrogen Processing Corporation, Malvern, Pennsylvania, U.S.A. The remainder of the apparatus in FIGS. 1 through 34 except for the platen **217**, O-rings **282** and **332**, the ball bearings **228** and **229**, the spring **238**, the washers **365**, and rubber printing bands **220**, are composed of suitable lightweight moldable plastic materials, for example, acetal, acrylonitrile-butadiene-styrene, or the like, but the ink roll **311** is preferably constructed of porous vinyl. Accordingly, the apparatus is very light in weight, and easy and convenient to use with a minimum of fatigue.

Other embodiments and modifications of this invention will suggest themselves to those skilled in the art, and all such of these as come within the spirit of this invention are included within its scope as best defined by the appended claims.

What is claimed is:

1. Label printing and applying apparatus, comprising: a frame having frame sections, a subframe having subframe sections mounted in the frame, a print head for printing selected data on a web at a printing zone, a pair of parallel flanges connected to the print head and straddling the subframe, each subframe section having a ball track, each flange having a ball track corresponding to the related subframe section ball track, a ball bearing received between each flange and its related subframe section, an applicator mounted downstream of the print head, means mounted by the subframe for feeding the web to the printing zone, and means including a manually actuatable operator mounted by the frame for sequentially driving the print head and the web feeding means.

2. Label printing and applying apparatus, comprising: a frame having frame sections, a subframe mounted in the frame, a print head for printing selected data on a web at a printing zone, means mounting the print head on the subframe for movement toward and away from the printing zone, an applicator mounted downstream of the print head, means mounted by the subframe for feeding the web to the printing zone, and means mounted by the frame for sequentially driving the print head and the web feeding means, the driving means including a manually operable lever and further including a gear disposed in the frame on each side of the subframe, a pair of gear sections connected to the print head and in engagement with the gears, means drivingly connecting the operator and the gears, and means providing a drive connection between one of the gears and the web feeding means.

3. Label printing and applying apparatus, comprising: a frame having frame sections, a subframe having subframe sections mounted in the frame, a print head for printing selected data on a web at a printing zone, a pair of parallel flanges connected to the print head and straddling the subframe, each flange having a gear section, each subframe section having a ball track, each flange having ball track corresponding to the related subframe section ball track, a ball bearing received between each flange and its related subframe section, an applicator mounted downstream of the print head, means mounted by the subframe for feeding the web to the printing zone, and means including a manually actuatable operator mounted by the frame for sequentially driving the print head and the web feeding means, the driving means including a gear disposed in the frame on each side of the subframe and in meshing engagement with the gear sections, means drivingly connecting the operator and the gears, and a drive connection between one of the gears and the web feeding means.

4. Label printing and applying apparatus, comprising: a frame having frame sections, a subframe mounted in the frame, the subframe having a pair of outwardly facing tracks, a print head for printing selected data on a web at a printing zone, the print head having guide means straddling the subframe and cooperable with the subframe tracks to effect guided movement of the print head toward and away from the printing zone, means mounted by the subframe for feeding the web to the printing zone, and means including a manually actuatable operator mounted by the frame for sequentially driving the print head and the web feeding means.

5. Label printing and applying apparatus, comprising: a frame having a handle, an applicator mounted by the frame, an operator movably mounted at the handle, a subframe having a track, means for removably mounting the subframe in the frame, a print head mounted directly on the subframe track for reciprocating movement toward and away from a printing zone, means carried by the subframe for feeding a web of labels toward the printing zone into cooperation with the print head, the subframe having a pair of subframe sections enabling ready assembly and disassembly of the label feeding means with respect to the subframe, and means drivingly coupling the operator with the print head and the label feeding means.

6. Label printing and applying apparatus, comprising: a frame having a handle, an operator movably mounted at the handle, a split subframe having a pair of subframe sections removably mounted in the frame, means for removably connecting the subframe sections to each other, a print head movably mounted by the subframe toward and away from a printing zone, an applicator mounted downstream of the print head, means for feeding a web of labels toward the printing zone into cooperation with the print head, the feeding means includes a feed wheel

disposed between the subframe sections, and means drivingly coupling the operator with the print head and the label feeding means, the coupling means includes a driven member, a pawl carried by the driven member, and a ratchet wheel cooperable with the pawl and drivingly coupled to the feed wheel.

7. Label printing and applying apparatus, comprising: a frame having a handle, an operator movably mounted at the handle, a split subframe having a pair of subframe tions removably mounted in the frame, a print head movably mounted directly by the subframe toward and away from a printing zone, an applicator mounted downstream of the print head, a feed wheel carried by the subframe for feeding a web of labels toward the printing zone into cooperation with the print head, and means drivingly coupling the operator with the print head and the label feeding means, the coupling means including gear means driven by the operator for driving the feed wheel and the print head and further including means coupled to the feed wheel and to the gear means for varying the position relative to the printing zone to which the labels are fed by the feed wheel when the operator is actuated.

8. Label printing and applying apparatus, comprising: a frame having a handle, the frame having frame sections, an applicator mounted by the frame, a operator movably mounted at the handle, a subframe removably mounted in the frame, the subframe having subframe sections, a snap-fit connection between the subframe sections, a snap-fit connection between each frame section and the subframe, means cooperable with one of the snap-fit connections for preventing the subframe sections from being accidentally unsnapped while the frame sections are being unsnapped, a print head movably mounted by the subframe toward and away from a printing zone, means for feeding a web of labels towards the printing zone into cooperation with the print head, and means for drivingly coupling the operator with the print head and the label feeding means.

9. Label printing and applying apparatus, comprising: a frame having a handle, the frame having frame sections, an applicator mounted by the frame, an operator movably mounted at the handle, a subframe removably mounted in the frame, the subframe having subframe sections, a snap-fit connection between one frame section and its next adjacent subframe section, a snap-fit connection between the subframe sections, a snap-fit connection between the other frame section and its next adjacent subframe section, a print head movably mounted by the subframe toward and away from a printing zone, means for feeding a web of labels toward the printing zone into cooperation with the print head, and means for drivingly coupling the operator with the print head and the label feeding means.

10. Label printing and applying apparatus, comprising: a frame having a handle, a manually engageable operator disposed at the handle, printing means disposed in the frame, a subframe removably mounted in the frame, means mounted by the subframe and coupled to the operator for advancing a web of label material to the printing means, an applicator disposed beyond the printing means, the frame having a pair of frame sections, the subframe having a pair of subframe sections, a snap-fit connection between the subframe sections, a snap-fit connection between each frame section and the subframe, and means cooperable with one of the snap-fit connections for preventing the subframe from being accidentally unsnapped while the frame sections are being unsnapped.

11. Label printing and applying apparatus, comprising: a frame having a handle, a manually engageable operator disposed at the handle, printing means disposed in the frame, a subframe removably mounted in the frame, means mounted by the subframe nad coupled to the operator for advancing a web of label material to the printing means, an applicator disposed beyond the printing means, the frame having frame sections, the subframe having subframe sections, a snap-fit connection between the subframe sections, a snap-fit connection between each frame section and the subframe, and means for preventing the subframe from being accidentally unsnapped while the frame sections are being unsnapped, wherein the preventing means comprises a projection connected to one frame section and engageable with the snap-fit connection between the subframe sections to prevent the snap-fit connection between the subframe sections from being unsnapped until the other frame section has been unsnapped from the subframe and until the subframe is unsnapped from the one frame section.

12. Label printing and applying apparatus, comprising: a delaminator for delaminating labels from a web of supporting material, a platen and a cooperable print head disposed upstream of the delaminating means for printing on the labels, the supporting material web having a plurality of cuts, there being weakening of the web adjacent each cut, each cut providing a drive face, a toothed wheel for pulling the web of supporting material across the delaminating means, an applicator disposed beyond the delaminating means for applying a label to merchandise, means for applying a braking force to the web upstream of the platen, the toothed feed wheel having a plurality of teeth, a die wheel in mating relationship with the toothed feed wheel between which the supporting material web passes for causing the teeth to break successively through the web at the weakening as the toothed feed wheel rotates, means for successively stripping the web from the teeth as the toothed feed wheel rotates, and means for sequentially driving the print head and the toothed wheel the driving means including a manually operable actuator and a gear drivingly coupling the actuator to the print head and to the toothed wheel.

13. Label printing and applying apparatus, comprising: a frame, a subframe mounted to the frame, a print head for printing selected data on a web at a printing zone, two ball tracks mounted by the subframe, two ball tracks mounted to the print head, one subframe ball track and one print head ball track constituting a pair of ball tracks, the other subframe ball track and the other print head ball track constituting another pair of ball tracks, a ball bearing between each pair of ball tracks, an applicator mounted downstream of the print head, means mounted by the subframe for feeding the web to the printing zone, and means for sequentially driving the print head and the web feeding means, the driving means including a manually operable actuator and a gear drivingly coupling the actuator to the print head and to the web feeding means.

14. Label printing and applying apparatus, comprising: a frame having a handle, an operator movably mounted at the handle, a subframe mounted by the frame, a print head movably mounted by the subframe toward and away from a printing zone, two ball tracks mounted by the subframe, two ball tracks mounted to the print head, one subframe ball track and one print head ball track constituting a pair of ball tracks, the other subframe ball track and the other print head ball track constituting another pair of ball tracks, a ball bearing between each pair of ball tracks, an applicator mounted downstream of the print head, a feed wheel carried by the subframe for feeding a web of labels toward the printing zone into cooperation with the print head, and means drivingly coupling the operator with the print head and the label feeding means, the coupling means including a gear driven by the operator for driving the feed wheel and the print head and further including means coupled to the feed wheel and to the gear for varying the position relative to the printing zone to which the labels are fed by the feed wheel when the operator is actuated.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,798,106 Dated March 19, 1974

Inventor(s) William A. Jenkins and Paul H. Hamisch, Jr.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 50, "form" should be --from--. Column 6, line 53, the "a" in "accordingly" should be capitalized. Column 9, line 40, the second occurrence of "formed" should be deleted. Column 9, line 53, "underside" has been misspelled. Column 10, line 53, "in" has been misspelled. Column 11, line 65, "comprised" has been misspelled. Column 13, line 20, "the" (second occurrence) should be --one--. Column 14, line 44, claim 4, "straddling" has been misspelled. Column 15, line 9, claim 7, "split" should be deleted; line 10, claim 7, "sections" has been misspelled. Column 15, line 73, claim 11, "and" has been misspelled. Column 16, line 29, claim 12, "weakening" should be --weakenings--; line 33, claim 12, "," has been omitted after --wheel--.

Signed and sealed this 17th day of September 1974.

(SEAL)
Attest:

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