

Jan. 6, 1959

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2,867,183

MACHINES FOR MAKING VACUUM CLEANER BAGS

Filed Dec. 12, 1957

6 Sheets-Sheet 1

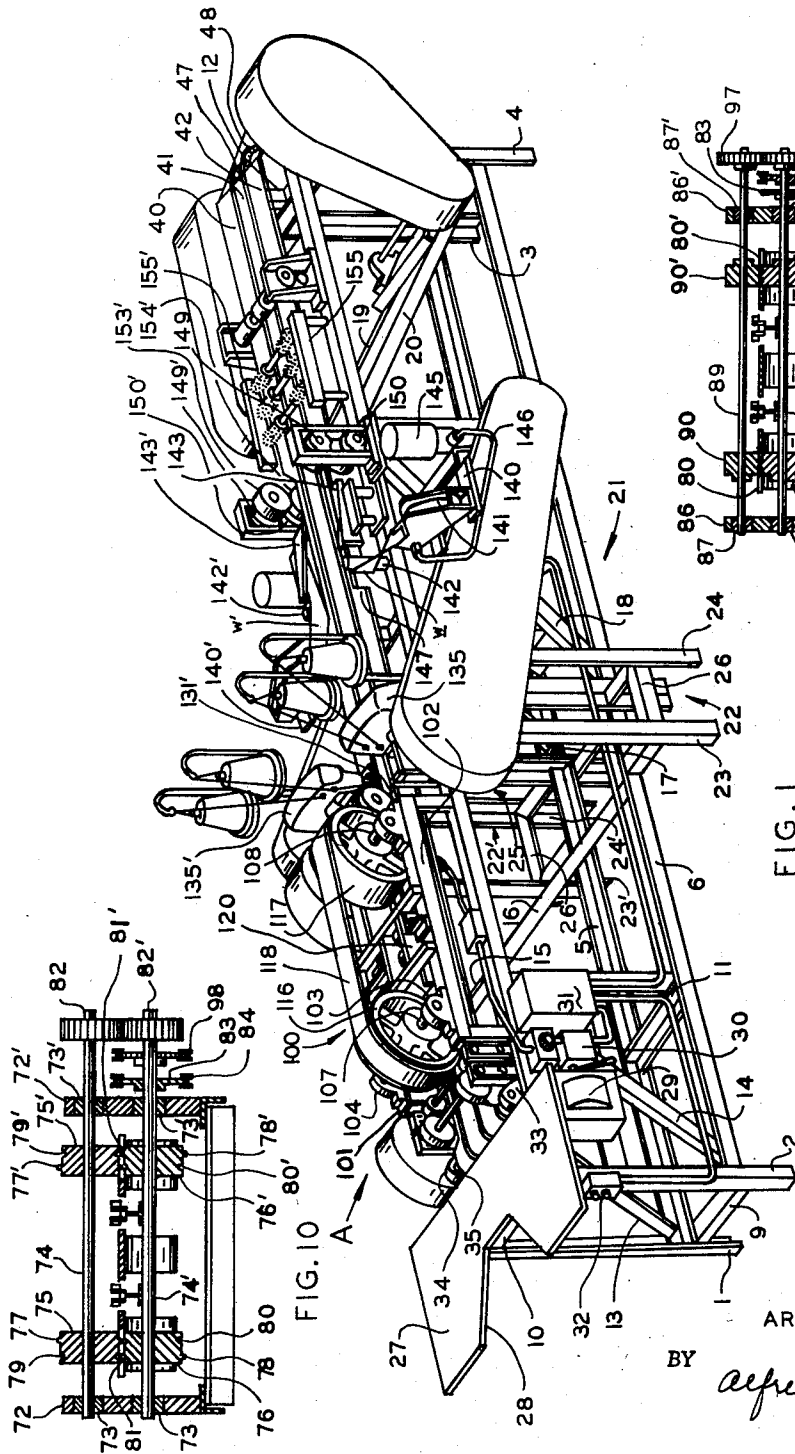


FIG. 1

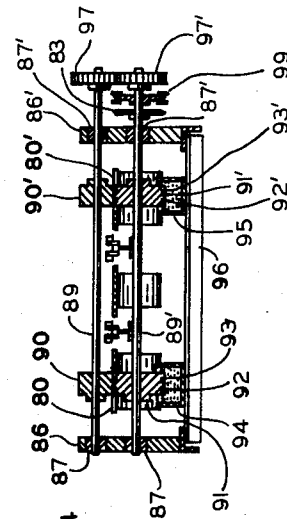


FIG. 9

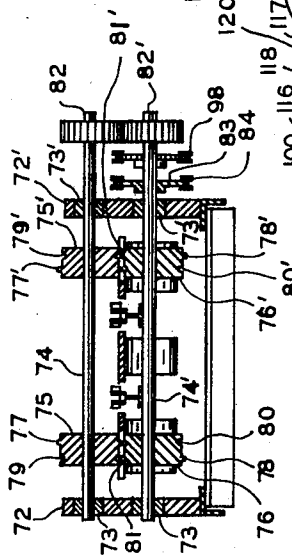


FIG. 10

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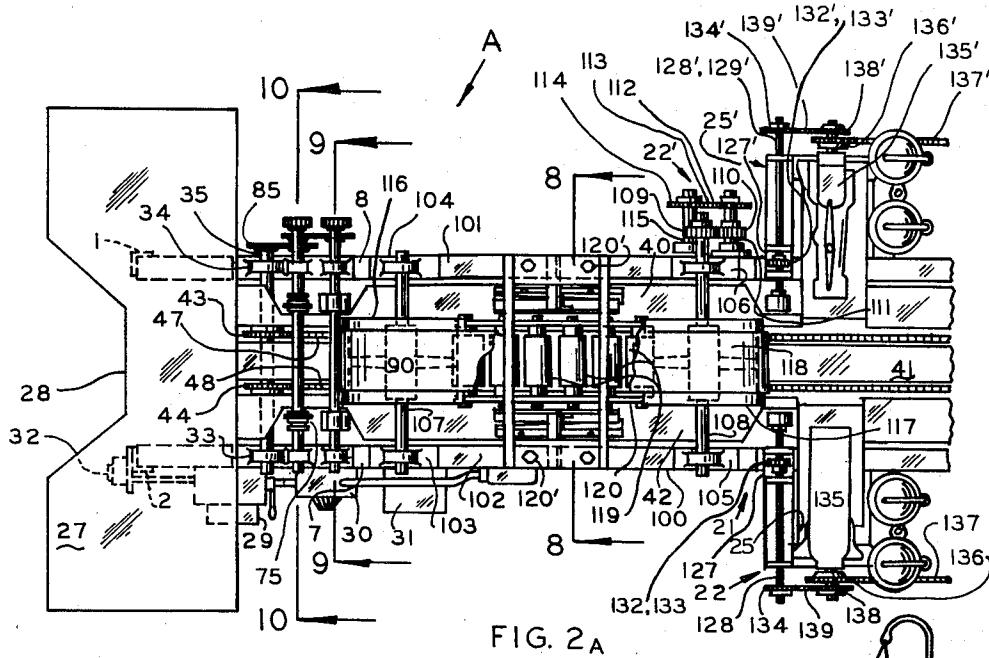


FIG. 2A

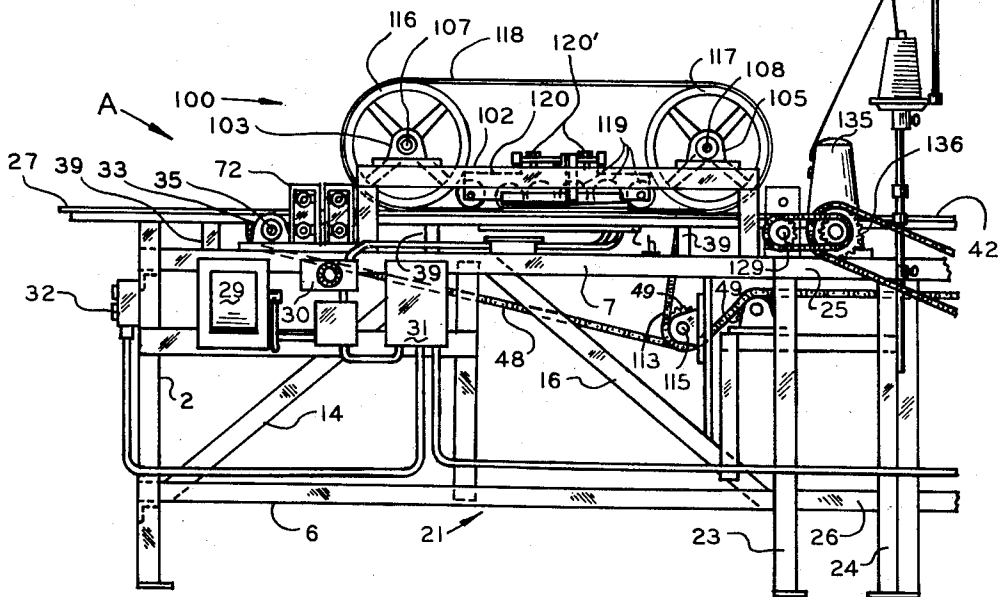


FIG. 3A

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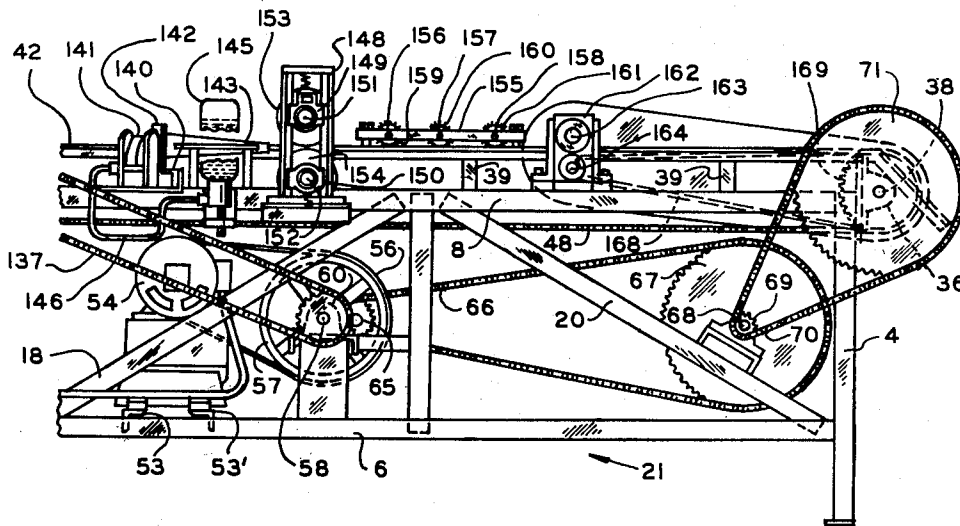
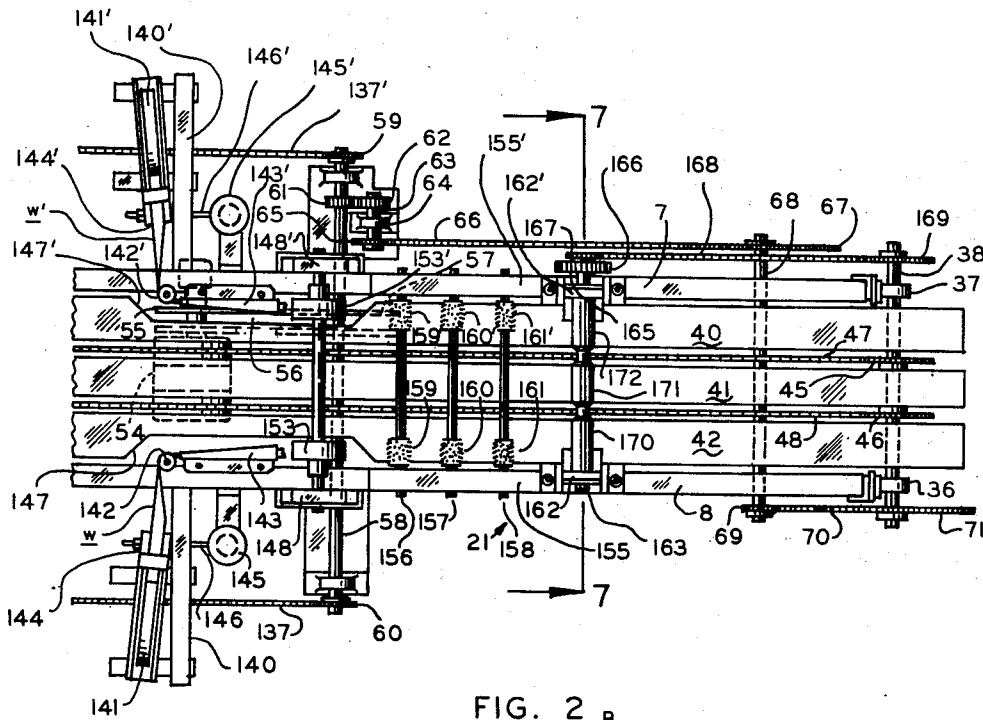
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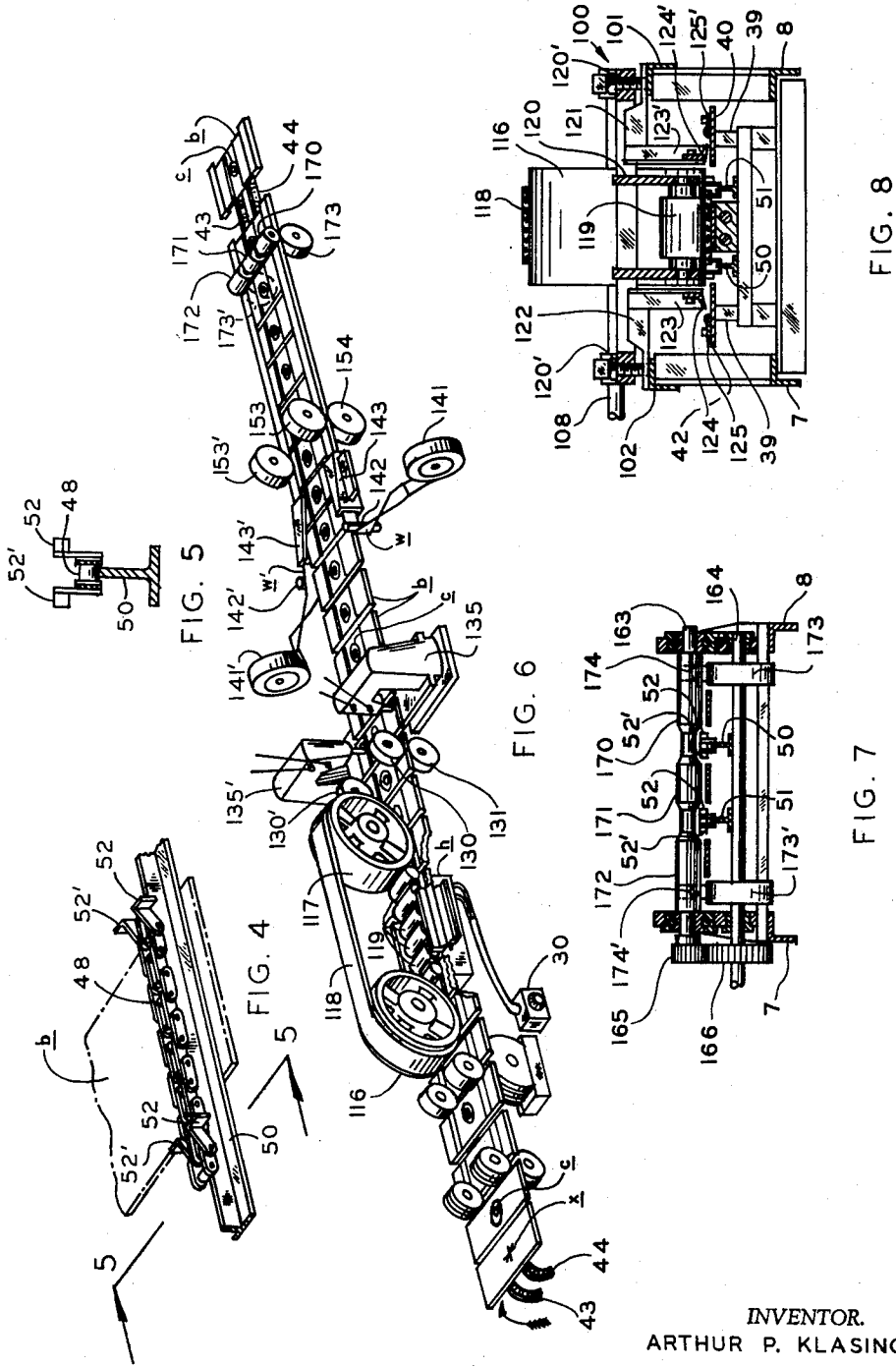
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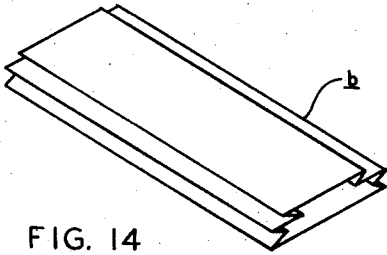


FIG. 14

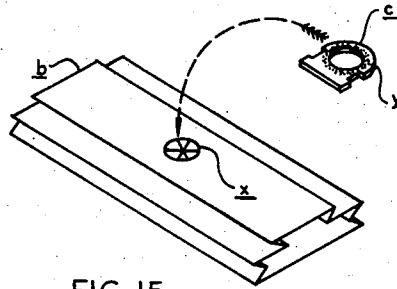


FIG. 15

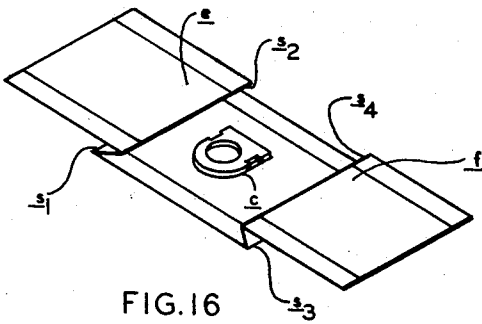


FIG. 16

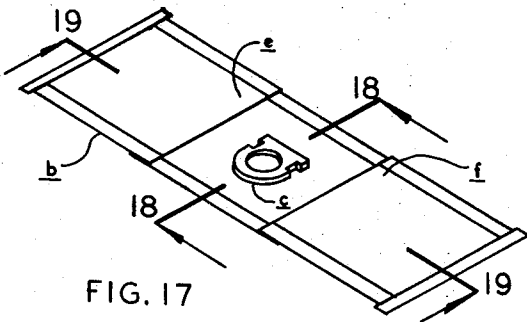


FIG. 17



FIG. 18

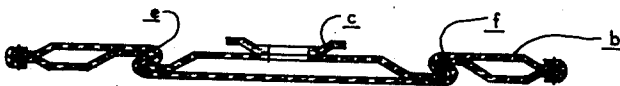


FIG. 19

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2,867,183

MACHINES FOR MAKING VACUUM CLEANER BAGS

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Application December 12, 1957, Serial No. 702,368

13 Claims. (Cl. 112—10)

This invention relates in general to certain new and useful improvements in automatic bag making machinery and, more particularly, to a machine for making vacuum cleaner bags from paper.

This application is a continuation-in-part of my co-pending application Serial No. 542,871, filed October 26, 1955, now Patent No. 2,820,424.

Modern vacuum cleaners are, for the most part, designed to employ disposable dust collecting bags made of paper or other similar inexpensive material. This is particularly true of the smaller tank-type vacuum cleaners. The bag, however, must be very inexpensive and yet possess rather specific structural characteristics. It must be as pervious to air as possible and yet be capable of retaining dust particles and finely divided household debris of all sorts. Furthermore, the bag must be physically strong so as to resist rupture or tearing during insertion into, and removal from, the vacuum cleaner and finally the bag must have some very convenient and secure means for attachment to the air discharge throat of the vacuum cleaner, thereby affording trouble-free operation for the housewife. Paper bags having all these characteristics have been developed and are in use, but heretofore have necessarily been made by hand and, therefore, are comparatively expensive.

One type of vacuum cleaner manufactured by the General Electric Company employs a disposable bag having the aforementioned characteristics, but the vacuum cleaner is so constructed that the bag must be manufactured with a pair of spaced folded seams on opposite sides of the collar that attaches the bag to the vacuum cleaner discharge throat.

It is, therefore, the primary object of the present invention to provide an automatic machine for making vacuum cleaner bags which possess all the above described physical and structural characteristics.

It is another object of the present invention to provide a machine of the type above stated which is capable of producing vacuum cleaner bags and bags of similar type at a high rate of speed and with a minimum of manual labor or attention so that manufacturing costs are reduced to an absolute minimum.

It is also an object of the present invention to provide a machine of the type stated which is capable of forming folds in the bag during the manufacture thereof.

With the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawings—

Figure 1 is a perspective view of a bag making machine constructed in accordance with and embodying the present invention;

Figures 2a and 2b, when taken together, constitute a top plan view of the bag making machine, said views necessarily being split in order that the scale of the drawing could be large enough to show the details of the machine;

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Figures 3a and 3b, when taken together, constitute a front elevational view of the bag making machine, said views being split for the same reasons as apply to Figures 2a and 2b;

Figure 4 is a fragmentary perspective view schematically showing the manner in which the bags are conveyed through the machine;

Figure 5 is a fragmentary sectional view taken along line 5—5 of Figure 4;

Figure 6 is a perspective view schematically showing the various co-ordinated operations-performing elements of the machine;

Figure 7 is a fragmentary sectional view taken along line 7—7 of Figure 2b;

Figures 8, 9, and 10 are fragmentary sectional views taken along lines 8—8, 9—9, and 10—10, respectively, of Figure 2a;

Figures 11, 12, and 13 are fragmentary transverse sectional views taken along the length of the folding shoes forming part of the present invention, and showing the manner of folding the seams in the bag-blank;

Figure 14 is a perspective view of the bag-blank used in the manufacture of the vacuum cleaner bag by the machine of the present invention;

Figure 15 is an exploded perspective view of the bag-blank;

Figure 16 is a perspective view of the bag-blank showing the folded seams therein;

Figure 17 is a perspective view of the completed vacuum cleaner bag; and

Figures 18 and 19 are sectional views taken along lines 18—18 and 19—19, respectively of Figure 17.

Referring now in more detail and by reference characters to the drawings, which illustrate a preferred embodiment of the present invention, A designates a bag making machine comprising a table-like angle-iron structure including four main vertical legs 1, 2, 3, 4, horizontal bottom-rails 5, 6, horizontal top-rails, 7, 8, cross-members, 9, 10, 11, 12, and angularly positioned braces 13, 14, 15, 16, 17, 18, 19, 20, all welded together into a unitary machine frame 21. Also welded to the rails 5, 6, 7, 8, and extending laterally therefrom are transversely aligned side extensions 22, 22', consisting of legs 23, 24, 23', 24', U-shaped top frames 25, 25', and U-shaped bottom frames 26, 26'.

Rigidly mounted on the rear or "feed" end of the machine A and extending crosswise over the frame 22 is a flat table 27 having a large U-shaped indentation 28 in its outer margin to provide clearance space in which a worker can stand for feeding the machine. Also rigidly mounted on the side of the frame 22 are a main switch 29, a heat control rheostat 30, an electric speed control 31, and a push button starter switch 32, all of which are conventional and, therefore, are not shown or described in detail.

Bolted or otherwise suitably mounted upon the top-rails 7, 8, just forwardly of the table 27, are aligned pillow-blocks 33, 34, for operatively supporting a horizontal cross-shaft 35, which is journaled at its ends therein. Similarly bolted upon the top-rails 7, 8, at the forward end thereof, are pillow-blocks 36, 37, for operatively supporting a horizontal cross-shaft 38. Welded to the top-rails 7, 8, at suitably spaced intervals are a number of short vertical uprights 39 which support three spaced parallel slide-plates 40, 41, 42, extending horizontally and lengthwise from one end of the machine A to the other with their upper faces coplanar with the top surface of the table 27. Pinned, keyed, or otherwise rigidly mounted upon the cross-shafts 35 are two sprockets 43, 44, which are respectively located in the spaces between the slide-plates 40, 41, 42, and similarly mounted upon the cross-shaft 38 are sprockets 45, 46,

respectively in line, lengthwise of the machine A, with the sprockets 43, 44. Trained around the sprockets 43, 45, and 44, 46, are roller chains 47, 48, the return runs of which are supported in the usual manner by a series of idler sprockets 49. The forward runs of the chains 47, 48, are slid over and are supported by horizontal I bars 50, 51, which are so mounted that the chains 47, 48, run horizontally in the spaces between the slide-plates 40, 41, 42. The chains 47, 48, are furthermore, provided, at uniformly spaced intervals, with upstanding pairs of pusher-cars 52, 52', which project upwardly above the plane of the top surfaces of the slide-plates 40, 41, 42, and engage the rear margins of bag-blanks *b* as they are fed into the machine A, as shown in Figure 4 and as will presently be more fully described.

Suitably mounted between the bottom-rails 5, 6, about midway of the frame 21 upon cross-members 53, 53', is a large electric motor 54 having a drive pulley 55 which is connected by a belt 56 to a transmission pulley 57 which, in turn, is keyed upon a cross-shaft 58 having drive sprockets 59, 60, and a pinion-gear 61. The latter meshes with a similar pinion-gear 62 which is pinned upon a short jack-shaft 63 journaled in a pillow-block 64 and provided at its other end with a sprocket 65 connected by a roller chain 66 to a sprocket 67 keyed upon one end of a cross-shaft 68. At its opposite end, the cross-shaft 68 is provided with a sprocket 69 which is connected by a roller chain 70 to a large drive sprocket 71 pinned to the cross-shaft 38, so that when the motor 54 is energized, the feed-chains 47, 48, will be driven in the direction of the arrow in Figure 6.

Mounted on the top rails 7, 8, and extending upwardly therefrom are journal frames 72, 72' which support bearings 73, 73' the latter journalling spaced parallel shafts 74, 74'. Rigidly secured to the shafts 74, 74' are co-operating pairs of scoring rollers 75, 76, 75', 76', the outer peripheries of which are provided with annular ribs 77, 78, 77', 78' and annular complementary grooves 79, 80, 79', 80', which receive the ribs 77, 78, 77', 78'. The ribs 77, 78, 77', 78' and grooves 79, 80, 79', 80', furthermore, meet approximately in the plane of the slide plates 40, 41, 42, and the slide plates 40, 42 are cut away at 81, 81' to provide a clearance space therefor. At their outer ends the shafts 74, 74' are provided with meshing gears 82, 82' and also mounted on the shaft 74' is a drive sprocket 83 having a roller chain 84 trained therearound, the latter, in turn, being trained around and driven by a sprocket 85 mounted on the shaft 35.

Also welded or otherwise rigidly secured to the top rails 7, 8, and forwardly of the journal frames 72, 72' are journal frames 86, 86' which support bearings 87, 87' for journalling spaced parallel shafts 89, 89'. Rigidly mounted on the shafts 89, 89' are opposed applicator rolls 90, 91, 90', 91', the lower rolls 91, 91' being formed with spaced annular grooves 92, 93, 92', 93', and are partially immersed in glue pots 94, 95, the latter being rigidly mounted on a cross member 96 welded at its opposite ends to the top rails 7, 8, all as best seen in Figures 2a, and 9 and for purposes presently more fully appearing. Mounted on the outer ends the shafts 89, 89' are meshing gears 97, 97', and also mounted on the shaft 89' is a sprocket 97 which is aligned with a sprocket 98 on the shaft 82'. Trained around the sprockets 97, 98 is a roller chain 99.

Welded upon the top-rails 7, 8, forwardly of the journal frames 86, 86' and extending upwardly and thereacross is a super-structure 100 preferably formed of angle-iron members and including top-bars 101, 102, which support pairs of pillow-blocks 103, 104, and 105, 106, in which shafts 107, 108, are respectively journaled, the latter projecting outwardly beyond the machine frame 21 and being provided with a gear 109 which meshes with a similar gear 110 mounted on a jack-shaft 111 which is also provided with a sprocket 112 connected by a roller chain 113 to a sprocket 114 pinned on a shaft 115, the

latter being a shaft upon which an idler sprocket 49 is mounted.

Mounted upon the shafts 107, 108, are relatively large drum-wheels 116, 117, around which is trained a heavy somewhat flexible belt 118, the lower horizontal run of which lays directly upon the slide-plate 41 and is resiliently pressed down thereon by a series of pressing rollers 119 which are journaled in a floating frame 120, the latter being more or less loosely supported within the framework 100 and provided with adjustable limit-screws 120', all as best seen in Figures 3a and 8.

Welded or otherwise rigidly secured to the top bars 101, 102 intermediate the shafts 107, 108 by means of channels 121, 122 are inner folding shoes 123, 123' each having lateral flanges 124, 124' which are slightly above the plane of the slide plates 40, 42. Bolted or otherwise secured to the slide plates 40, 42 are outer folding shoes 125, 125' having flanges 126, 126' the inner edges of which are arcuate and spaced from the flanges 124, 124' at their rear margins as best seen in Figures 8 and 11. The flanges 126, 126', furthermore, progressively overlap the flanges 124, 124' lengthwise of each other as best seen in Figures 11-13.

Mounted on the top rails 7, 8, forwardly of the drum wheel 117 are journals 127, 127' which rotatably support shafts 128, 129, 128', 129', the latter having pairs of opposing squeeze rollers 130, 131, 130', 131' which are in longitudinal alignment with the folding shoes 123, 123', 125, 125'. Also mounted on the shafts 128, 129 are meshing gears 132, 133, 132', 133', and the shafts 129, 129' are, furthermore, provided with sprockets 134, 134'.

Mounted on the side frames 22, 22', are two sewing machines 135, 135', respectively, the latter being a so-called lefthand machine. Otherwise, the sewing machines 135, 135', are conventional lock-stitch machines and are located so that the needles and feed plates thereof are spaced laterally outwardly from the outer edges of the slide-plates 40, 42, respectively. The sewing machines 135, 135', are, furthermore, provided with drive-sprockets 136, 136', respectively, for driving connection by means of roller chains 137, 137', to the sprockets 59, 60, and with drive-sprockets 138, 138' for driving connection with the sprockets 134, 134' by means of roller chains 139, 139'.

Forwardly of the sewing machines 135, 135', the top-rails 7, 8, are provided with outrigger-frames 140, 140', which support tape-rolls 141, 141', and tape-guide rolls 142, 142', around which continuous webs *w*, *w'*, of tape are turned from horizontal to vertical paths and fed into tape folders 143, 143'. As the tape-webs *w*, *w'*, feed off the tape rolls 141, 141', they pass over glue-applicator rolls 144, 144', which are supplied with liquid glue from glue reservoirs 145, 145', by means of feed-pipes 146, 146'. As will be seen from Figure 2b, the folders are located in the line or path of movement of the transverse margins of the bag-blanks and accordingly the outer longitudinal margins of the slide-plates 40, 42, are cut away as at 147, 147', to afford clearance therefor.

Mounted on the top-rails 7, 8, forwardly of the outrigger-frames 140, 140', are vertical journal frames 148, 148', for slidably supporting bearings 149, 150, and 149', 150', which operatively support shafts 151, 152, the latter being provided with pairs of opposing rolls 153, 154, and 153', 154', which are respectively located along the path of movement of the transverse edges of the bag-blank, all as best seen in Figure 2b and for purposes presently more fully appearing.

Also mounted on the top-rails 7, 8, forwardly of the vertical journal frames are vertically adjustable bars 155, 155', and freely journaled therein are three spaced parallel horizontal shafts 156, 157, 158, each provided adjacent their opposite ends with pairs of cylindrical brushes 159, 159', 160, 160', and 161, 161', respectively.

Bolted or otherwise rigidly mounted on the top-rails 7, 8, are vertical bearing stands 162, 162', in which are

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journaled two vertically spaced horizontal shafts 163, 164, respectively located above and below the slide-plates 40, 41, 42, and mechanically interconnected by meshing pinions 165, 166. The lower shaft 164 is also provided with a sprocket 167 which is drivingly connected by a roller chain 168 to a drive sprocket 169 pinned upon the shaft 38. Pinned or otherwise suitably mounted on the shaft 162 for rotation therewith are hold-down rollers 170, 171, 172, and similarly mounted on the shaft 163 are two cutoff rolls 173, 173', having cut-off blades 174, 174', which coast against the rolls 170, 172', for purposes presently more fully appearing.

At their extreme forward ends, the slide-plates 40, 41, 42, are bent downwardly at an angle to form a discharge chute over which the finished bags may slide.

The vacuum cleaner bags are made by forming an open-ended tubular bag-blank *b* and a collar *c*, as shown in Figures 14 and 15. The bag-blank *b* is formed as a bellows-pinch tube on a conventional bellows-pinch machine, the latter being no part of the present invention. On the bellows-pinch machine, or by separate procedure if desired, the bag-blank *b* is provided with a central aperture *x* around which the collar *c* is to be secured. The collar *c* is also blanked out in a conventional die-cutting machine and coated with an annular band of thermoplastic adhesive *y*. The adhesive can be applied well in advance of use so that when the collars are manually fed to the bag-making machine A, the adhesive is dry and very slightly tacky. It is also possible to provide an automatic machine in which a stack of die-cut collars *c* is placed, so that the collars can be fed one at a time from the stack across glue-printing rolls and delivered to the operator in timed relation to the operation of the machine A, in which case the adhesive is wet. A suitable supply of bag-blanks *b* and collars *c* are placed on the feed-table 27 and the operator feeds them into the machine A by laying a bag-blank *b* crosswise on the slide-plates 40, 41, 42, with the aperture *x* up, and placing a collar *c*, adhesive side down, upon the bag-blank around the aperture *x* with enough manual pressure so that the slightly tacky adhesive will temporarily hold it in place. One set of ears 52, 52', will then come around and pick up the bag-blank *b*, as shown in Figure 4, and feed it between the scoring rollers 75, 76, 75', 76', where the ribs 77, 78, 77', 78', and grooves 79, 80, 79', 80' form score lines *s*₁, *s*₂, *s*₃, *s*₄, thereon. Next the bag-blanks *b* pass between the applicator rollers 90, 91, 90', 91', where spaced bands of glue *a*₁, *a*₂, *a*₃, *a*₄, are deposited thereon, and thereafter the bag-blanks *b* are fed beneath the belt 118 over the heater *h* which will soften the band of adhesive *y* and the collar will be pressed down into adherent position by the weight of the rollers 119. At the same time the folding shoes 123, 125, 123', 125', fold the bag-blank *b* as shown in Figures 11-13 so that when the bag-blank *b* is fully folded as shown in Figures 16 and 17, the folds will be along the score lines *s*₁, *s*₂, *s*₃, *s*₄, and thereby form lap seams *e*, *f* with the band of glue *a*₁, *a*₂, *a*₃, *a*₄, in facewise contact. As the bag-blank *b* travels forwardly away from the rollers, it passes between the squeeze rollers 130, 131, 130', 131', and the bands of glue *a*₁, *a*₂, *a*₃, *a*₄, pressed together thereby sealing the seams *e*, *f*. Next the bag-blank *b* passes beneath the sewing machines 135, 135', and its transverse edges seamed shut. Next in order, the bag-blank *b* passes through the folders and the end seams enfolded in the tape-webs *w*, *w*', coming off the tape-rolls 141, 141'.

Thereupon, the bag-blank *b* passes beneath the squeeze rolls 153, 154 and 153', 154', which serve to press the folded tape down into tightly adherent position over the end closure seams formed by the sewing machines 135, 135'. Finally, the tape is smoothed out by the brushes 159, 159', 160, 160', 161, 161'.

It will, of course, be understood that bag-blanks *b* are fed into the machine A one right after another. Furthermore, the lines of stitches formed by the sewing ma-

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chines 135, 135', and the tape webs *w*, *w*', are continuous, so the bags actually are formed into a continuous or connected chain as they progress through the machine A. However, the cut-off rolls 173, 173', are of such diameter as to sever the tape-webs *w*, *w*', upon each revolution, between the blanks *b*, as shown in Figures 17-19 to form vacuum cleaner bags having glued folds, strong air tight end-closure seams, and collars *c*, the edges of which are unglued so as to slip readily under the attachment clip of the vacuum cleaner. Since the vacuum cleaner and its component parts are conventional and do not form a part of the present invention, they are not illustrated or described herein.

It should be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the machines for making vacuum cleaner bags may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. An automatic machine for making bags out of open-ended flat tubular bag-blanks; said machine comprising a relatively long straight line conveyor having a plurality of spaced pushers for engaging the longitudinal margins of the bag-blank, means for folding the bag-blank intermediate the ends to form lap seams therein, means for securing the folded over portions together to close the lap-seams, means for applying a cardboard patch to a side wall of the bag-blank, means for stitching the ends of the bag-blank to close same, means for applying covering strips of tape over the stitched ends of the bag-blank, and means for cutting the several bag-blanks apart.

2. An automatic machine for making bags out of open-ended flat tubular bag-blanks; said machine comprising a relatively long straight line conveyor having a plurality of spaced pushers for engaging the longitudinal margins of the bag-blank, means for folding the bag-blank intermediate the ends to form lap seams therein, means for securing the folded over portions together to close the lap-seams, means for applying a cardboard patch to a side wall of the bag-blank, means for closing the ends of the bag-blank, means for applying covering strips of tape over the ends of said bag-blank, and means for cutting the several bag-blanks apart.

3. An automatic machine for making bags out of open-ended flat tubular bag-blanks; said machine comprising a relatively long straight line conveyor having a plurality of spaced pushers for engaging the longitudinal margins of the bag-blank, means for applying adhesive intermediate the ends of the bag-blank on the outer surface thereof, means for folding the bag-blank in the region of said adhesive to form lap-seams, means for imposing pressure on the folded over portions to close the lap-seams, means for applying a cardboard patch to a side wall of the bag-blank, means for stitching the ends of the bag-blank to close same, means for applying covering strips of tape over the stitched ends of the bag-blank, means for cutting the several bag-blanks apart, and means for driving the conveyor, the adhesive applying means, the pressure imposing means, the patch applying means, the stitching means, the tape applying means and the cutting means in timed relation to each other.

4. An automatic machine for making bags out of open-ended flat tubular bag-blanks; said machine comprising a relatively long straight line conveyor having a plurality of spaced pushers for engaging the longitudinal margins of the bag-blank, means for applying adhesive intermediate the ends of the bag-blank on the outer surface thereof, means for folding the bag-blank in the region of said adhesive to form lap-seams, means for imposing pressure on the folded over portions to adhesively close the lap-seams, means for applying a cardboard patch to a side wall of the bag-blank, means for stitching the ends of the bag-blank to close same, means for applying covering

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strips of tape over the stitched ends of the bag-blank, and means for cutting the several bag-blanks apart.

5. An automatic machine for making bags out of open-ended flat tubular bag-blanks, said machine comprising a relatively long straight line conveyor having a plurality of spaced pushers for engaging the longitudinal margins of the bag-blank, means for applying adhesive intermediate the ends of the bag-blank on the outer surface thereof, plate-like means for folding the bag-blank in the region of said adhesive to form lap-seams, means for imposing pressure on the folded over portions to adhesively close the lap seams, means for applying a cardboard patch to a side wall of the bag-blank, means for stitching the ends of the bag-blank to close same, means for applying covering strips of tape over the stitched ends of the bag-blank, and means for cutting the several bag-blanks apart.

6. An automatic machine for making bags out of open-ended flat tubular bag-blanks; said machine comprising a relatively long straight line conveyor having a plurality of spaced pushers for engaging the longitudinal margins of the bag-blank, means for applying adhesive intermediate the ends of the bag-blank on the outer surface thereof, plate-like means located on each side of said conveyor for folding the bag-blank in the region of said adhesive to form lap-seams, means for imposing pressure on the folded over portions to adhesively close the lap seams, means for applying a cardboard patch to a side wall of the bag-blank, means for stitching the ends of the bag-blank to close same, means for applying covering strips of tape over the stitched ends of the bag-blank, and means for cutting the several bag-blanks apart.

7. An automatic machine for making bags out of open-ended flat tubular bag-blanks; said machine comprising a relatively long straight line conveyor having a plurality of spaced pushers for engaging the longitudinal margins of the bag-blank, means for applying adhesive intermediate the ends of the bag-blank on the outer surface thereof, a pair of cooperating plate-like elements located on each side of said conveyor for folding the bag-blank in the region of said adhesive to form lap-seams, means for imposing pressure on the folded over portions to adhesively close the lap seams, means for applying a cardboard patch to a side wall of the bag-blank, means for stitching the ends of the bag-blank to close same, means for applying covering strips of tape over the stitched ends of the bag-blank, and means for cutting the several bag-blanks apart.

8. An automatic machine for making bags out of open-ended flat tubular bag-blanks; said machine comprising a relatively long straight line conveyor having a plurality of spaced pushers for engaging the longitudinal margins of the bag-blank, means for applying adhesive intermediate the ends of the bag-blank on the outer surface thereof, roller means for folding the bag-blank in the region of said adhesive to form lap-seams, roller means for imposing pressure on the folded over portions to adhesively close the lap-seams, means for applying a cardboard patch to a side wall of the bag-blank, means for stitching the ends of the bag-blank to close same, means for applying covering strips of tape over the stitched ends of the bag-blank, and means for cutting several bag-blanks apart.

9. An automatic machine for making bags out of open-ended flat tubular bag-blanks; said machine comprising a relatively long straight line conveyor having a plurality of spaced pushers for engaging the longitudinal margins of the bag-blank, means for applying adhesive intermediate the ends of the bag-blank on the outer surface thereof, means for folding the bag-blank in the region of said adhesive to form lap-seams, means for imposing pressure on the folded over portions to close the lap-seams, means for applying a cardboard patch to a side wall of the bag-blank, said means including a heated element located in the path of the conveyor so that the bag-blank will slide thereover and means for imposing pres-

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sure on the bag-blanks as they pass over the heated element, means for closing the ends of the bag-blank, means for applying covering strips of tape over the closed ends of the bag-blank, and means for cutting the several bag-blanks apart.

10. An automatic machine for making bags out of open-ended flat tubular bag-blanks; said machine comprising a relatively long straight line conveyor having a plurality of spaced pushers for engaging the longitudinal margins of the bag-blank, means for applying adhesive intermediate the ends of the bag-blank on the outer surface thereof, means for folding the bag-blank in the region of said adhesive to form lap-seams, means for imposing pressure on the folded over portions to adhesively close the lap-seams, means for applying a cardboard patch to a side wall of the bag-blank, said means including a heated element located in the path of the conveyor so that the bag-blank will slide thereover and means for imposing pressure on the bag-blanks as they pass over the heated element, means for stitching the ends of the bag-blank to close same, means for applying covering strips of tape over the stitched ends of the bag-blank, and means for cutting the several bag-blanks apart.

11. An automatic machine for making bags out of open-ended flat tubular bag-blanks; said machine comprising a relatively long straight line conveyor having a plurality of spaced pushers for engaging the longitudinal margins of the bag-blank, means for forming score lines intermediate the ends of the bag-blank, means for folding the bag-blank along the score lines to form lap seams therein, means for securing the folded over portions together to close the lap-seams, means for applying a cardboard patch to a side wall of the bag-blank, means for stitching the ends of the bag-blank to close same, means for applying covering strips of tape over the stitched ends of the bag-blank, and means for cutting the several bag-blanks apart.

12. An automatic machine for making bags out of open-ended flat tubular bag-blanks; said machine comprising a relatively long straight line conveyor having a plurality of spaced pushers for engaging the longitudinal margins of the bag-blank, means for forming score lines intermediate the ends of the bag-blank, means for applying adhesive to the bag-blank on the outer surface thereof in the region of the score lines, means for folding the bag-blank along the score lines to form lap-seams, means for imposing pressure on the folded over portions to close the lap seams, means for applying a cardboard patch to a side wall of the bag-blank, means for stitching the ends of the bag-blank to close same, means for applying covering strips of tape over the stitched ends of the bag-blank, and means for cutting the several bag-blanks apart.

13. An automatic machine for making bags out of open-ended flat tubular bag-blanks; said machine comprising a relatively long straight line conveyor having a plurality of spaced pushers for engaging the longitudinal margins of the bag-blank, means for forming score lines intermediate the ends of the bag-blank, means for applying adhesive to the bag-blank on the outer surface thereof in the region of the score lines, means for folding the bag-blank along the score lines to form lap-seams, means for imposing pressure on the folded over portions to close the lap-seams, means for applying a cardboard patch to a side wall of the bag-blank, means for stitching the ends of the bag-blank to close same, means for applying covering strips of tape over the stitched ends of the bag-blank, means for cutting the several bag-blanks apart, and means for driving the conveyor, the scoring means, the adhesive applying means, the pressure imposing means, the patch applying means, the stitching means, the tape applying means and the cutting means in time relation to each other.

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