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(54) SELF-ADHESIVE WEBS AND FASTENING TABS

(71) We, AVERY INTERNATIONAL CORPORATION, a corporation organised and existing under the laws of the State of Delaware, United States of America, residing at 415 Huntington Drive, San Marino, California 91108, United States of America, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:-

This invention relates to web constructions of linerless tab stock suitable for supply primarily, but not exclusively, to diaper manufacturers and for separation by the manufacturers into individual diaper tab constructions of Y-configuration for application to individual diapers, two tabs usually being applied to a diaper. By "linerless' is meant the absence of any adhesive-protecting liner of release paper or the like that has to be separated and disposed of by the person applying the diaper. By "Y-configuration" is meant a tab configuration in the shape of a letter Y whose two legs and stem all bear adhesive, the legs being adapted to be fastened by the manufacturer to both sides of one part of a diaper adjacent an edge, and the stem being adapted to be fastened to another part of the diaper by a person applying the diaper. Tabs of Y-configuration provide increased or doubled strength where it most needed, i.e. at the diaper-to-tab connection which receives the strain when the person applying the diaper pulls on the tab to draw the diaper tight before closing it.

Prior examples of tabs of Y-configuration are U.S. patent 3,833,456 assigned to Avery Products Corporation and U.S. patent 3,848,594 assigned to the Procter & Gamble Company. The former is linerless while the latter is not.

Up to the present time all diaper tab stock suitable for forming tabs of Y-configuration, whether linerless or not, has comprised multiple substrates laminated together into a laminate web construction.

Non-laminate or single substrate linerless constructions are proposed, or at least referred to, in the following patents:

3,853,129	12/1974	Kozak	Union Carbide Corporation
3,874,386	4/1975	Kozak	Union Carbide Corporation
3,930,503	1/1976	Tritsch	Johnson & Johnson
3,955,576	5/1976	Safford	Kimberly-Clark Corporation

However none of such constructions provide a Y-configuration.

Other prior art includes:

3,616,144	10/1971	Hamaguchi et al.	Daiel Shikogyo Kabushiki Kaisha; Tanaka-ya Shojii Kabushiki Kaisha; and Sekisui Kagaku Kogyo Kabushiki Kaisha
3,950,824	4/1976	Karami	The Kendall Company
Appl. Ser. No. 624,870	Filed 10/1975	Richman et al	Avery Products Corporation (common assignee)

Appl. Ser. No.	Filed	Nemeth	Avery International Corporation (common assignee)
743,640	11/1976	et al.	

The present invention provides, for the first time, a non-laminate or single substrate linerless tab stock for forming tabs of Y-configuration. The tab stock can be fabricated of a single initially flat but flexible substrate and completely by web coating and slitting steps and without any laminating or folding by the fabricator of the diaper tab stock. The tab stock so made may be adapted to be self-wound for storage and shipment. The result is the achievement of substantial economies and efficiencies in the manufacture of diaper tab stock for tabs of Y-configuration, and in the manufacture and application of tabs formed from such stock.

According to the present invention, there is provided a web construction for linerless diaper tab stock made up of a single flat but flexible coated elongate substrate and adapted to be slit transversely and formed into individual substrate elements, each comprising a linerless tab which in use adopts a Y-configuration, the legs of the Y each having an adhesive layer on their facing sides for use in attaching the tab to an edge of an article, there being a release coating on the opposite side of one of the legs, the stem of the Y being formed by a section of the tab integral with the legs, which stem section has an adhesive coating in seperable adhesive contact with the release coating until manipulation, upon use of the tab, into the Y-configuration, which elongate substrate includes first, second, third, fourth and fifth longitudinal band portions, said first and third band portions including adhesive on one side of the substrate, the adhesive on the first and third band portions comprising the adhesive on the legs, and release means on the other side, the release means on the first band portion comprising the release coating on the one leg, said second band portion having no release means on the other side of the substrate to thereby define an anchoring portion where release means is absent, said fourth band portion being wider than the third band portion whereby when the other side of the substrate at the fourth band portion is folded across said third band portion the fourth band portion reaches and at least partially crosses said anchoring portion, said fourth band portion having adhesive on the other side of the substrate and release means on the one side of the substrate at at least the part of the fourth band portion which is capable of crossing said anchoring portion when said fourth band portion is so folded, said fifth band portion including adhesive, comprising the adhesive coating on the stem section, and release means on opposite sides of the substrate at least when the web is unwound from a self-wound roll thereof.

The invention also provides a linerless self-adhesive fastening tab for attachment to an edge of an article, comprising an elongate single substrate element folded widthwise to form two confronting sections forming spaced-apart legs furnished on their facing sides with pressure sensitive adhesive for use in attaching the tab to the article with the legs straddling the edge thereof, the tab having a release coating on the opposite side of one of the two confronting leg sections, and a third section integral with the said two leg sections, the third section having an adhesive coating in separable adhesive contact with the release coating on the said one of the confronting leg sections, the arrangement being such that upon separating the adhesive coating of the third section from the release coating contacted thereby, the tab can be manipulated into a Y-configuration in which the third section forms the stem of the Y and the two leg sections form the confronting branches of the Y; and the invention embraces the tab when manipulated to the Y configuration.

The invention further provides an article of manufacture such as an item of disposable clothing, furnished with one or more tabs of Y-configuration according to the invention.

Embodiments of the invention will now be described by way of example only with reference to the accompanying drawings, in which:

Figure 1 is a diagrammatic cross-sectional view of a coated substrate which may be used in the manufacture of a web construction contemplated by the invention.

Figure 2 is a similar view of a web construction resulting from self-winding and then unwinding the coated substrate of Figure 1.

Figures 3 and 4 illustrate successive stages in the folding and application to a diaper of the web construction of Figure 2; Figure 4 may also be viewed as a side elevation of one form of individual diaper tab as applied on a diaper by a diaper manufacturer.

Figures 5 and 6 illustrate the use of the diaper tab seen in Figure 4.

Figure 7 is a view of another web construction contemplated by the invention.

Figure 8 is a view on a slightly enlarged scale of the application of the construction of Figure 7 to a diaper; Figure 8 may also be viewed as a side elevation of an individual diaper tab as applied on a diaper by a diaper manufacturer.

Figures 9 and 10 illustrate the use of the diaper tab seen in Figure 8.

Figure 11 is a view similar to Figure 10, with the diaper tab being shown on a scale more nearly in proper proportion to the diaper.

In Figure 1 a single substrate 10 is coated with release coatings 16*a*, 16*b*, and 16*c* and with

pressure sensitive adhesive coatings 17*a*, 17*b* and 17*c*. When this construction is self-wound, that is, wound on a core (not shown) with the adhesive coated face on the inside of the winding and then unwound, the adhesive 17*c* transfers from the top to the bottom of the construction to provide the linerless diaper tab stock illustrated in Figure 2. The winding of the stock may be done by the manufacturer of the diaper tab stock, and the unwinding may be done by the diaper manufacturer shortly before use of the stock in providing tabs for diapers.

In the web construction shown in section in Figure 2, the substrate 10, which is an elongate strip, has first, second, third, fourth and fifth longitudinal band portions parallel to the length of the strip labeled respectively 11, 12, 13, 14 and 15. The first and third band portions 11 and 13 include adhesive on the top side of the substrate and release means on the bottom side. The second band portion 12 has no release means on the bottom side of the substrate and thereby defines an anchoring portion 18 where release means is absent. Preferably, the second band portion 12 has no adhesive on the top side and the adhesive 17*a* on the top side of the first band portion 11 terminates short of the release coat 16*a* on the bottom side, as shown.

The fourth band portion 14 is sufficiently wide for the bottom side of the substrate 10 at the fourth band portion 14 to be folded across the third band portion 13 and reach and at least partially cross the anchoring portion 18 provided at the second band portion 12 and preferably completely cross it as seen most clearly in Figure 3, that is the fourth portion is wider than the third portion. The fourth band portion 14 has adhesive 17*c* on the bottom side of the substrate 10 and release means 16*c* on the top side of the substrate 10 at at least the part of the fourth band portion 14 which is capable of crossing the anchoring portion 18 when the fourth band portion 14 is folded across the third band portion, as will be understood from a study of Figures 2 and 3. The fifth band portion 15 also includes adhesive 17*c* and release means 16*c* on opposite sides of the substrate. In the embodiment of Figures 1 to 6, the band portions 14 and 15 are both provided with adhesive on the same side of the substrate 10. At least the edgemost portion of the adhesive 17*c* associated with the fifth band portion 15 is releasably supportable on the release means 16*a* of the first band portion 11 as seen in Figures 3 and 4, and can be released therefrom as seen in Figures 5 and 6.

The total width of the fourth and fifth band portions 14 and 15 is substantially equal to or slightly less than the total width of the first three band portions 11, 12 and 13. Preferably the total width is slightly less so as to form a slight step or pick-off between the two edges of the substrate 10 as seen in Figures 3 and 4.

When the diaper tab stock is unwound by a diaper manufacturer in the configuration of Figure 2, it can then be folded once to give the configuration of Figure 3 and then folded again around a diaper edge while or immediately after being severed into an individual diaper tab by a transverse cut across the substrate 10 forming one of a successive series of cuts forming a succession of diaper tabs. Folding around the diaper is preferably done so as to form a gap 19 which is adhesive-free on the diaper side due to termination of the adhesive 17*a* short of the termination of the release coat 16*a* and the absence of adhesive on the originally top side of the substrate at the first and second band portions in the vicinity of the termination of the release coat 16*a*, as previously described.

To fasten a diaper, a parent can lift the end of the tab associated with the fifth band portion, pull it to draw the diaper tight, and press the fifth band portion against another part of the diaper to be joined, as seen in Figure 5. The diaper tab thereby assumes a Y-configuration. The two legs of the Y at the righthand part of the construction as viewed in Figures 5 and 6 provide increased strength when the person applying the diaper pulls on the tab to draw the diaper tight before closing it with the free end of the tab. Figure 6 illustrates the sharing of the pulling forces between both legs of the Y. The pulling forces are transmitted to the stem of the Y through the anhcoring portion 18 and particularly that part thereof closest to the point where the Y branches or divaricates. The termination of release coat 16*a* determines the point of divarication, which is away from the edge of the diaper due to the gap 19. This fact, and the absence of adhesive on the diaper side of the substrate 10 at the gap 19, contribute to the sharing and balancing of the pulling forces between both legs of the Y, since the legs are free to independently stretch or adjust as required to best share the pull imposed on the tab and distribute such pull to both sides of the diaper portion that is gripped by the legs of the Y. This feature is an advantageous characteristic of tabs of the Y-configuration type. However it is not believed to have been previously achieved in single substrate constructions.

Thus it will be seen that diaper tab stock of the Y-configuration type has been provided from a non-laminate or single substrate linerless tab stock which itself can be fabricated completely by web coating and slitting steps and without any laminating or folding by the fabricator of the diaper tab stock, such construction also being adapted for self-winding for storage and shipment. Such construction realizes substantial economies and efficiencies in the manufacture of diaper tab stock for tabs of Y-configuration. The diaper tab manufacturer may readily and efficiently use such stock in the manufacture and application of

Y-configuration tabs.

Another embodiment of the invention is shown in Figures 7 to 11. In the web construction shown in section in Figure 7, a single substrate 20, which is an elongate strip, has first, second, third, fourth and fifth longitudinal band portions parallel to the length of the strip labeled respectively 21, 22, 23, 24 and 25. The first and third band portions 21 and 23 include adhesive 17*a* and 27*b* on the top side of the substrate and release means 26*a* and 26*b* on the bottom side. The second band portion 22 has no release means on the bottom side of the substrate to thereby define an anchoring portion 28 where release means is absent. The fourth band portion 24 is sufficiently wide for the bottom side of the substrate 20 at the fourth band portion 24 to be folded across the third band portion 23 and reach at least partially across the anchoring portion 28 provided at the second band portion 22, that is, the fourth portion is wider than the third portion. The fourth band portion 24 has adhesive 27*c* on the bottom side of the substrate 20 and release means 26*c* on the top side of the substrate 20 at at least the part of the fourth band portion 24 which is capable of crossing the anchoring portion 28 when the fourth band portion 24 is folded across the third band portion, as will be understood from a study of Figures 7 and 8. The fifth band portion 25 also includes adhesive 27*d* and release means 26*d* on opposite sides of the substrate. In the embodiment of Figures 7 to 11, the band portions 24 and 25 are provided with adhesive on opposite sides of the substrate 20. At least the edgemost portion of the adhesive 27*d* associated with the fifth band portion 25 is releasably supportable on the release means 26*c* of the fourth band portion 24, as seen in Figure 8, can be released therefrom as seen in Figures 9 and 10.

In this embodiment, the diaper manufacturer must fold the diaper tab stock three times as illustrated in Figure 8, one fold being around the diaper and the other two folds being folds of the construction on itself. These folds should be made by the manufacturer before severing the stock into individual diaper tabs and the fold which embraces the edge of the diaper may be performed prior to actual engagement of the diaper so that severance into individual tabs may occur without severing the diaper edge.

The tab as applied to the diaper by the manufacturer has the configuration of Figure 8. Again as in the earlier embodiment, an adhesive free gap is formed, as at 29. To fasten a diaper, a parent can lift the end of the tab associated with the fifth band portion as seen in Figure 9 and position the fifth band portion in association with another part of the diaper to be joined as seen in Figure 10. The diaper tab thereby assumes a Y-configuration. The two legs of the Y at the righthand part of the construction as viewed in Figures 9 and 10 provide increased strength when the person applying the diaper pulls on the tab to draw the diaper tight before closing it with the free end of the tab. Figure 10 illustrates the sharing of the pulling forces between both legs of the Y. The pulling forces are transmitted to the stem of the Y through the anchoring portion 28 and particularly that part thereof closest to the point where the Y branches or divaricates. Again, as in the previous embodiment, the termination of the release coat (in this case release coat 26*a*) determines the point of divarication which, due to the gap (29 in this case) is spaced from the diaper edge. Again, pulling forces tend to be shared and balanced between the two legs of the Y. Figure 11 illustrates the configuration of the tab under pulling stress, with the tab being shown on a scale more nearly in proper proportion to the diaper.

Thus it will be seen that diaper tab stock of the Y-configuration type has again been provided from a non-laminate or single substrate linerless tab stock which itself can be fabricated completely by web coating and slitting steps and without any laminating or folding by the fabricator of the diaper tab stock, such construction also being adapted for self-winding for storage and shipment. However, the embodiment of Figures 7 to 11 involves more folds than the previously described embodiment and a more intricate pattern of web coatings on the substrate. Accordingly the embodiment of Figures 1 to 6 is presently preferred over the embodiment of Figures 7 to 11.

WHAT WE CLAIM IS:-

1. A web construction for linerless diaper tab stock made up of a single flat but flexible coated elongate substrate and adapted to be slit transversely and formed into individual substrate elements, each comprising a linerless tab which in use adopts a Y-configuration, the legs of the Y each having an adhesive layer on their facing sides for use in attaching the tab to an edge of an article, there being a release coating on the opposite side of one of the legs, the stem of the Y being formed by a section of the tab integral with the legs, which stem section has an adhesive coating in separable adhesive contact with the release coating until manipulation, upon use of the tab, into the Y-configuration, which elongate substrate includes first, second, third, fourth and fifth longitudinal band portions, said first and third band portions including adhesive on one side of the substrate, the adhesive on the first and third band portions comprising the adhesive on the legs, and release means on the other side, the release means on the first band portion comprising the release coating on the one leg, said second band portion having no release means on the other side of the substrate to thereby define an

anchoring portion where release means is absent, said fourth band portion being wider than the third band portion whereby the other side of the substrate at the fourth band portion is folded across said third band portion the fourth band portion reaches and at least partially crosses said anchoring portion, said fourth band portion having adhesive on the other side of the substrate and release means on the one side of the substrate at at least the part of the fourth band portion which is capable of crossing said anchoring portion when said fourth band portion is so folded, said fifth band portion including adhesive, comprising the adhesive coating on the stem section, and release means on opposite sides of the substrate at least when the web is unwound from a self-wound roll thereof.

2. A web as claimed in claim 1 in which the fourth band portion is of a width such that when the other side of the substrate at the fourth band portion is folded across the third band portion the fourth band portion reaches entirely across said anchoring portion.

3. A web as in claim 1 or 2 in which the adhesive on the one side of the substrate at the first band portion terminates short ot the point at which the release means on the other side thereof terminates and the one side of the substrate at the second band portion is free of adhesive at least at the part of the second band portion that is adjacent the first band portion.

4. A web as in claim 1, 2, or 3 in which the adhesive of the fifth band portion is on the same side of the substrate as the adhesive of the fourth band portion.

5. A web as in claim 1, 2, 3, or 4 in which at least the edgemost portion of the adhesive of the fifth band portion is releasably supportable on the release means of the first band portion.

6. A web as in claim 1, 2, 3, 4 or 5 in which the total width of the fourth and fifth band portions is substantially equal to or slightly less than the total width of the first three band portions.

7. A web as in claim 3 in which the adhesive of the fifth band portion is on the opposite side of the substrate from the adhesive of the fourth band portion.

8. A device as in claim 7 in which at least the edgemost portion of the adhesive of the fifth band portion is releasably supportable on the release means of the fourth band portion.

9. A web as in claim 4, wherein the adhesive of the fifth band portion is coated on the release means thereof and is thereby arranged to transfer onto the opposite side of the fifth band portion when the adhesive and released coated web is unwound from a roll into which the web is wound after coating.

10. A web for use in making linerless self-adhesive tabs substantially as described.

11. Self adhesive linerless tabs made from the web claimed in any of claims 1 to 10.

12. A linerless self-adhesive fastening tab for attachment to an edge of an article, comprising an elongate single substrate element folded widthwise to form two confronting sections forming spaced-apart legs furnished on their facing sides with pressure sensitive adhesive for use in attaching the tab to the article with the legs straddling the edge thereof, the tab having a release coating on the opposite side of one of the two confronting leg sections, and a third section integral with the said two leg sections, the third section having an adhesive coating in separable adhesive contact with the release coating on the said one of the confronting leg sections, the arrangement being such that upon separating the adhesive coating of the third section from the release coating contacted thereby, the tab can be manipulated into a Y-configuration in which the third section forms the stem of the Y and the two leg sections form the confronting branches of the Y.

13. A linerless self-adhesive tabl according to claim 12, when manipulated to the Y-configuration.

14. Self adhesive linerless tabs substantially as described.

15. A method of making linerless tab stock and linerless self-adhesive tabs substantially as described.

16. An article of manufacture furnished with linerless tabs substantially as described.

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1590765 COMPLETE SPECIFICATION

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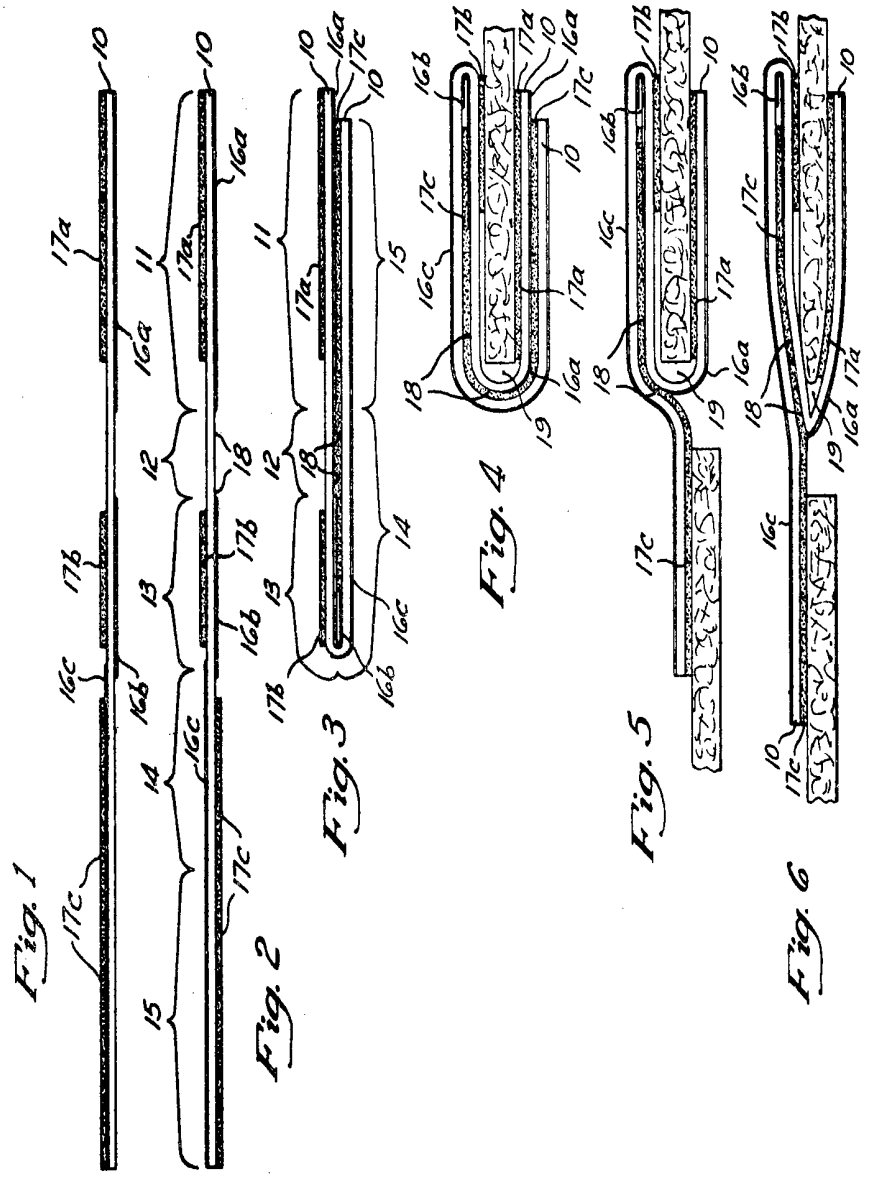

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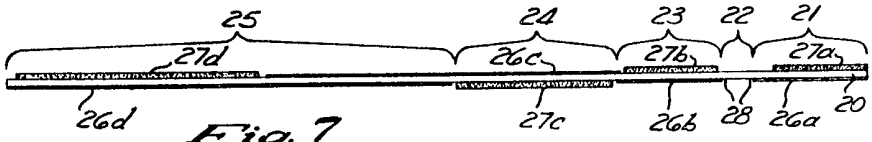

Fig. 7

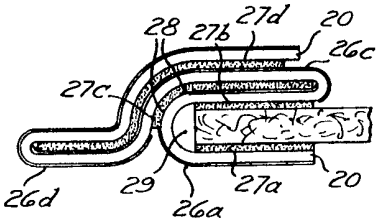

Fig. 8

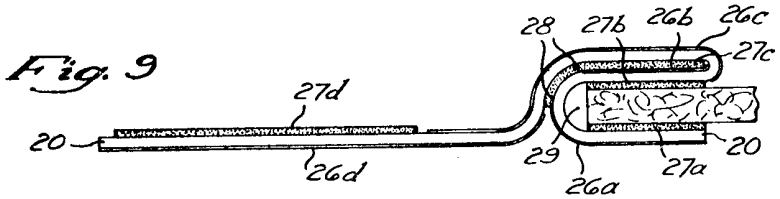

Fig. 9

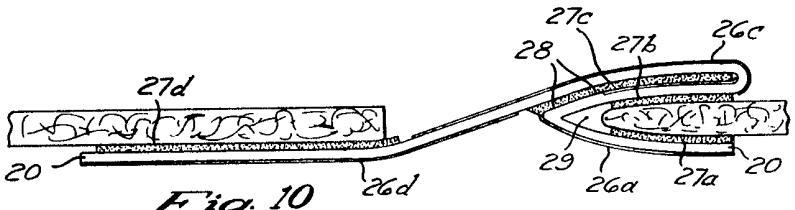

Fig. 10

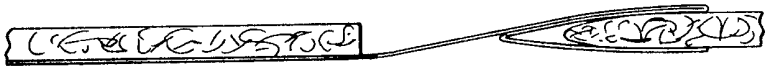

Fig. 11