# United States Patent [19]

**Blomqvist et al.**

[11] **3,847,710**

[45] **Nov. 12, 1974**


[54] **APPARATUS FOR APPLYING SECURING TABS TO DIAPERS, SANITARY TOWELS, COMPRESSES AND SIMILAR ABSORBENT BODIES**


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[73] Assignee: **Mo och Domsjo AB,** Ornskoldsvik, Sweden



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[51] **Int. Cl.** ..... **B32b 31/20,** B32b 31/10 B32b/21/18

[58] **Field of Search** ..... 156/511, 517, 521, 557, 156/560, 351, 354, 355, 363; 128/284, 287



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[57] **ABSTRACT**

Apparatus is provided for applying securing tabs to absorption products such as diapers, sanitary towels, compresses and the like, conveyed successively as single units in a continuous path, the securing tabs being coated on one side with adhesive to which is attached an easily removable protective paper, which comprises conveying the securing tabs continuously and successively in two parallel rows, on each side of the path of the absorption products, substantially at a right angle to the path of absorption products, at a level higher than and parallel to the path of absorption products, and with the gummed surfaces turned downward; removing the protective paper from the halves of the securing tabs in each row that face the parallelly fed row of securing tabs; separating each securing tab from its respective row of securing tabs; and pressing the separated securing tabs in pairs onto the absorption products, with the halves coated with protective paper turned away from each other, and extending beyond the corresponding edge of the respective absorption products transversely to the conveying direction for the absorption products.


**8 Claims, 7 Drawing Figures**

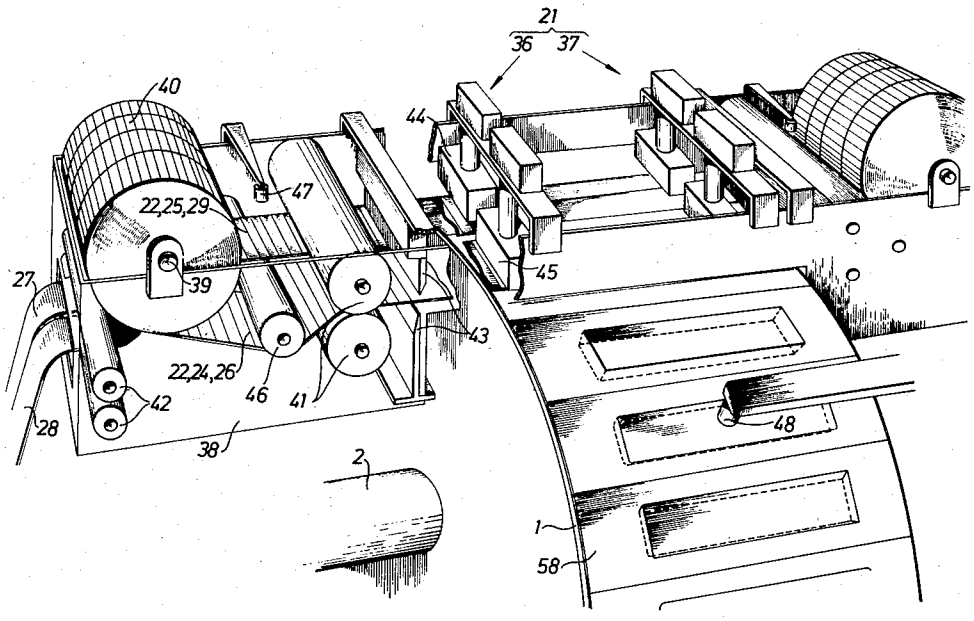


Fig.1

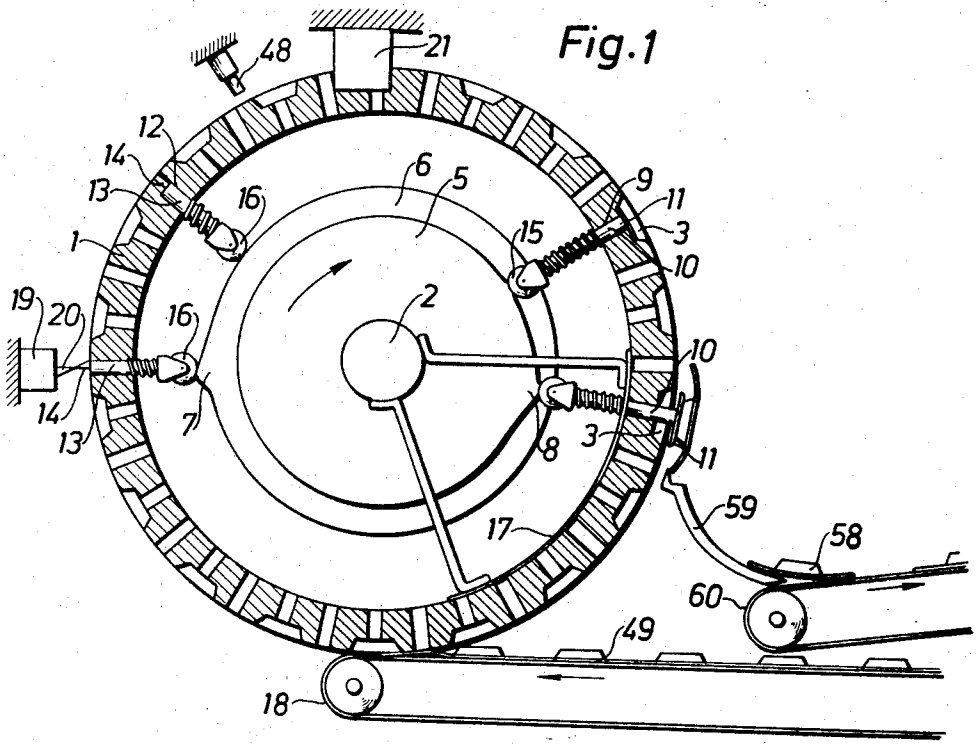

48
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Fig.2

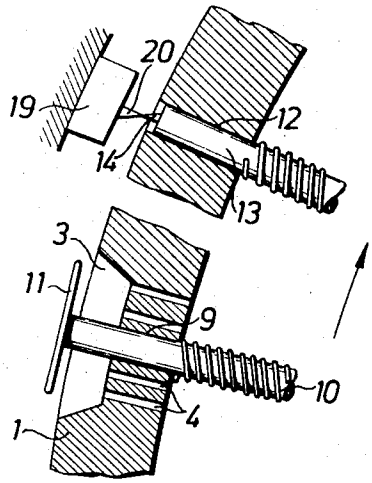

20
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Fig. 3

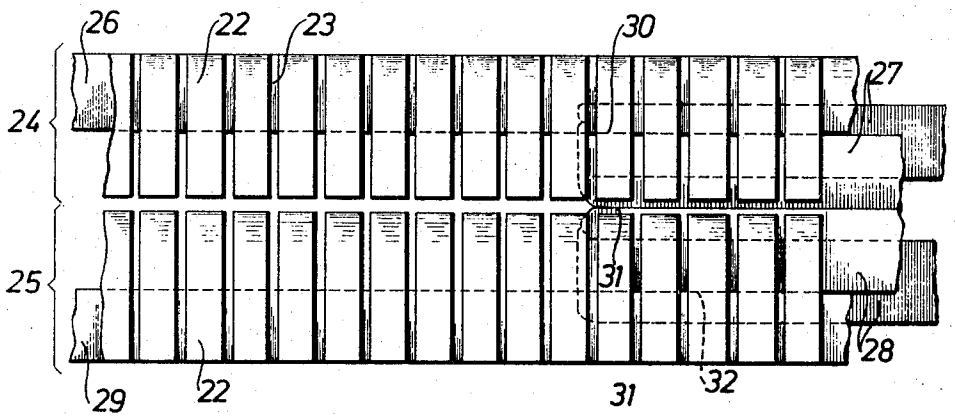



Fig. 4

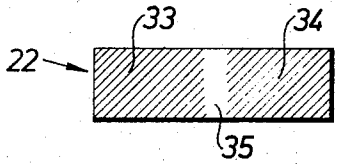



Fig. 6

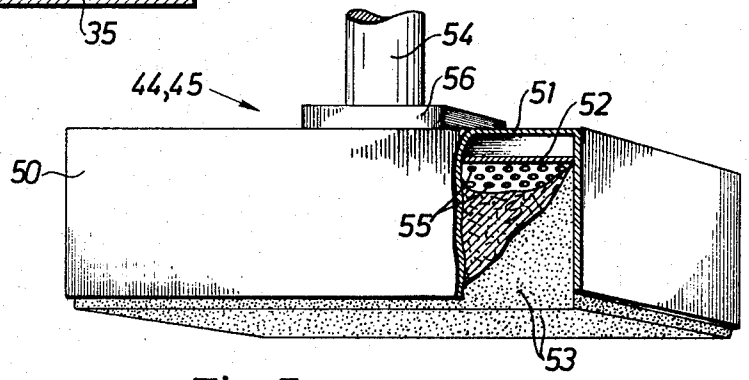
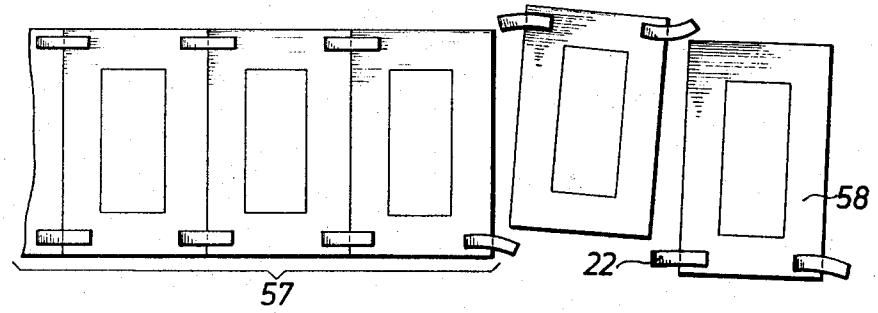



Fig. 7



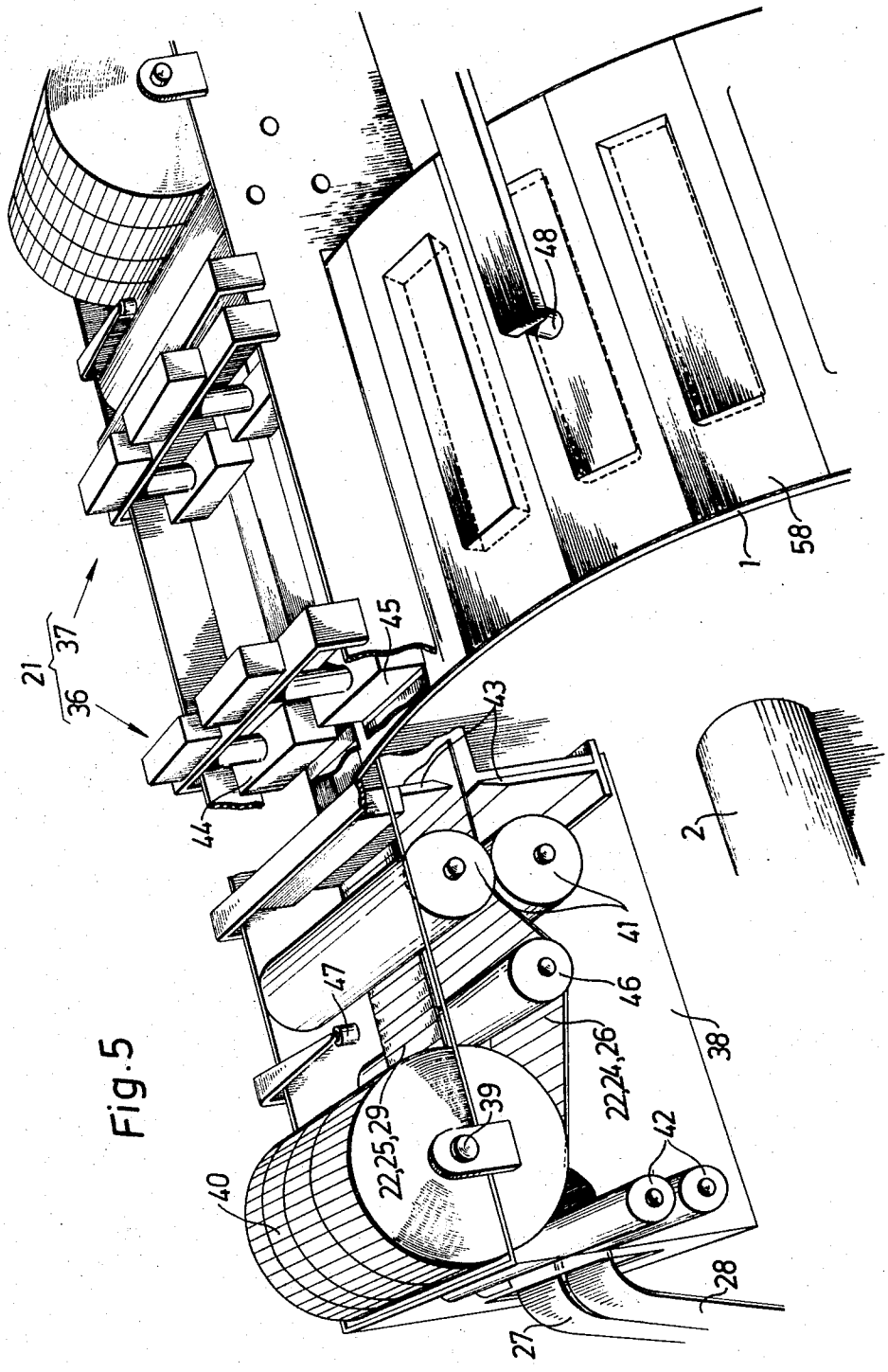



Fig.5

# APPARATUS FOR APPLYING SECURING TABS TO DIAPERS, SANITARY TOWELS, COMPRESSES AND SIMILAR ABSORBENT BODIES

The present invention relates to apparatus for applying securing tabs to single unit absorbent products such as diapers, sanitary towels, compresses and the like conveyed in a continuous path, which tabs are provided with an adhesive and protective paper.

One object of the invention is to accurately position the separate absorbent products moved in a continuous path relative to a means for applying the securing tabs thereto in a manner to permit the tabs to be applied with their longitudinal axis located parallel with the direction of movement of the absorbent products.

Another object of the invention is to enable the gummed securing tabs and the protective paper to be stored on one and the same storage reel, so that the tabs and the paper are joined together before being applied to the absorbent product.

A further object of the invention is to provide a simple apparatus for separating the absorbent products from a long strip thereof and to fix the securing tabs to the products.

With hitherto known methods of applying securing tabs of the aforementioned type to absorbent bodies such as diapers and the like advanced in a long strip, the tabs when placed on the bodies are positioned generally perpendicular to the direction of movement of the diapers. In this instance, the gummed portion of the securing tab — hereinafter called simply the securing tab — and the protective paper are applied to their respective side of the diapers in a manner such that roughly half of the tab and the paper project outwardly of the diaper edge and so that the outwardly projecting portions cover and adhere to each other. In order that these methods maybe carried out there are required separate means for applying the securing tabs and the protective paper, which greatly complicates the applicator and adds to its cost of manufacture.

Another disadvantage with known methods is that it is necessary to store the securing tabs and the protective paper on separate reels, thereby incuring unnecessary storage costs. A related disadvantage is that the protective paper cannot be cut into separate units when it is manufactured, but must be coiled in sheet form on the storage reels. In turn, this means that special apparatus for cutting the protective paper must be provided in immediate connection with the means for applying the securing tabs and the strips of protective paper on the diapers. Further, the cutting speed of the cutting apparatus must be accurately synchronized with the speed at which the diapers are moved and with the working speed of the applicating apparatus.

These disadvantages are circumvented by means of the present invention, which relates to apparatus for applying securing tabs to absorbent products such as diapers, sanitary towels, compresses and the like conveyed successively as single units in a long strip, said securing tabs being coated on one side with adhesive and thereupon an easily removable protective paper. The apparatus is characterized by means for conveying the securing tabs continuously and successively in two parallel rows on each side of the strip of the absorbent products substantially at a right angle to the strip of absorbent products at a level higher than and parallel to the strip of absorbent products and with the gummed surfaces turned downward, means for removing the protective paper, from the halves of the securing tabs in each row that face the parallelly fed row of securing tabs, means for separating each securing tab from the respective row of securing tabs, and means for pressing the separated securing tabs in pairs onto the absorbent products with the halves being coated with protective paper turned away from each other and extending beyond the corresponding edge of the respective absorbent product in a direction transverse to the conveying direction for the absorbent products.



In a preferred embodiment the apparatus according to the invention is mainly characterized in that the strip along which the absorbent products are conveyed, first as a long strip and then as single products separated from the long strip, is curved in the form of an arc of a circle of unitary radius, that the long strip of absorbent products and the products separated from the long strip are conveyed along the conveying path accurately positioned in relation thereto and with one and the same flat side turned towards the centre of the arc, that the protective paper is adhered to the portion of the gummed surface of the securing tab to be protected against unintentional contact before the securing tabs are applied to the absorbent products, that the absorbent products are separated from the long strip of products and the gummed securing tabs and protective paper are then affixed to the separate units in a manner such that the longitudinal axis of the securing tabs and the protective paper when applied to the products generally coincides with the conveying direction of the long strip and the separated absorbent products.

The invention also relates to apparatus, which comprises a device for conveying the absorbent products and a device for applying the securing tabs to the absorbent products and is characterized by two identical units positioned on both sides of the conveying device and at a higher level than said device, each of said units comprising a reel for storing two rolls of strips of securing tabs parallel to each other, a means for feeding the strips of securing tabs from the storage reel in two parallel rows towards the conveying device, a means for continuous stripping of the protective paper from the halves of the securing tabs in each row that face the parallelly fed row of securing tabs, a means for separating the securing tabs with the remaining protective paper from respective row of tabs and two identical, vertically movable applicator means, provided to retain a separated securing tab and while being moved downward to press said tab onto an absorbent product on the conveying device.

In a preferred embodiment the apparatus according to the invention is mainly characterized by the combination of a cylindrical drum mounted for rotation in the vertical plane and, when rotated, arranged to convey on the cylindrical surface thereof a long strip of absorbent products, such as diapers, sanitary towels, compresses, and the like continuously conveyed to the drum, there being disposed in the cylindrical surface of the drum through-passing openings or groups of openings in uniformly spaced relation in a row extending peripherally of the drum and corresponding to the spacing between the absorbent products in the long strip, evacuation means for creating a subpressure in the openings to draw the absorbent products onto the cylindrical surface of the drum, a first ejector rod arranged between each pair of openings or groups of

openings on the drum, the first ejector rod being arranged for movement in its longitudinal direction between an outer and an inner position and extending in the radial direction of the drum from a region immediately outside the cylindrical surface of the drum, through the cylindrical surface and to a first cam disc securely mounted to the drum and provided with a cam and arranged to move the first ejector rod to its outer and inner position, the first ejector rod being provided at its outer end with a first separating means for separating the absorbent products from the strip, the apparatus being further characterized by a second ejector rod arranged on the drum between each pair of first ejector rods, the second ejector rods being arranged for movement in their longitudinal direction between an outer and an inner position and extending in the radial direction of the drum from an area immediately externally of the cylindrical surface of the drum, through the cylindrical surface, and to a second cam disc securely mounted to the drum and provided with a cam and arranged to move the second ejector rod to its outer and inner position, the cam discs having a mutual position with the cams forming a certain angle with each other; a second separating means mounted adjacent the outer cylindrical surface of the drum opposite the cam of the first cam disc and arranged, in co-action with the first separating means to separate the absorbent products on the continuously advanced long strip of products from each other when corresponding ejector rods are moved to their outer position; and means located behind the second separating means when seen in the direction of rotation of the drum and adjacent the outer cylindrical surface of the drum for applying the securing tabs to the separate, continuously advanced absorbent products, the second ejector rods when moved to their outer position ejecting an absorbent product from respective recesses subsequent to the absorbent products being separated from the long strip and provided with securing tabs and the protective paper attached thereto.

The invention will now be described with reference to the accompanying drawings, in which

FIG. 1 illustrates in section a drum for conveying diapers on which securing tabs are to be applied, and elements and means co-operating with the drum for said purpose,

FIG. 2 is an enlarged view of a portion of the drum shown in FIG. 1,

FIG. 3 illustrates a strip of securing tabs arranged in two parallel rows,

FIG. 4 illustrates a securing tab having two separate gummed regions,

FIG. 5 illustrates in perspective an apparatus for applying securing tabs to the diapers carried by the drum,

FIG. 6 illustrates an element of the apparatus illustrated in FIG. 5, and

FIG. 7 illustrates a long strip of diapers provided with securing tabs and shows the manner in which the diapers are carried on the drum and two diapers separated from the long strip.

In FIG. 1, the reference numeral 1 indicates a cylindrical drum sealed at the end walls thereof in a manner to render it air-tight and mounted for rotation on a horizontal shaft 2 securely mounted in bearing blocks at the end thereof. The drum is connected to a motor via a gear ring mounted on one end wall of the drum and driven around the shaft 2 by said motor. Arranged in the shaft 2 is a recess in the form of a passage which opens out at one end of the shaft and at the centre portion thereof. The drum communicates via the passage with an evacuating fan for producing a subpressure in the drum. The bearing block, the drive motor, the gear ring and the recess in the shaft and the evacuating fan are of conventional design and are not shown in the Figures. On the outwardly facing portion of the cylindrical surface of the drum there are provided blind recesses 3, which in the illustrated embodiment have a substantially rectangular shape with the long sides of the rectangle extending parallel with the shaft 2. The recesses are identical to each other and are arranged in uniformly spaced relationship around the cylindrical surface of the drum, the spaces between the recesses corresponding to the spacing of the absorbent products in the long strip of such products on which securing tabs are to be affixed. Arranged in the bottom of each recess in the cylindrical surface of the drum are perforations 4 (see also FIG. 2); while securely mounted immediately adjacent each other on the shaft 2 are two single cam discs 5 and 6 (FIG. 1). The cam discs are arranged on the shaft approximately centrally of the recesses 3 in the cylindrical surface of the drum, with the cams 7 and 8 facing in opposite directions to each other. The bottom of the recesses 3 are provided with guide structures 9 for second ejector rods 10 mounted for reciprocating movement in the radial direction of the drum and cooperating with their respective recesses. The second ejector rods 10 extend from respective recesses 3 to the cam disc 5, against which they are biased by means of a spring. When the drum rotates, the second ejector rods 10 are caused to alternate between an outer and an inner position corresponding to the top and bottom camming position of the cam disc 5. The second ejector rods are provided on the outer end thereof with a pressure plate 11. When the second ejector rods occupy their outer position, corresponding pressure plates 11 project slightly beyond the recesses 3 and the outer cylindrical surface of the drum, while when the second ejector rods occupy their inner position, the corresponding pressure plates 11 are located on a level with the bottom of respective recesses. The cylindrical surface of the drum is provided with guide structures 12 between each recess. First ejector rods 13 are arranged in each guide structure in the radial direction of the drum and are mounted for reciprocating movement in its longitudinal direction and extend from respective guide structures 12 to the cam disc 6, against which they are biased by means of a spring. When the drum rotates, the first ejector rods 13 are moved between an outer and an inner position corresponding to the camming action of the cam disc 6. Each ejector rod 13 is provided on the free end thereof with a securely mounted knife 14, the edge of which is turned outwardly from the drum and extends parallel with the axis 2. In the outer and the inner positions of the ejector rods, the blades are located externally of and internally of the outer cylindrical surface of the drum. For the purpose of reducing friction between the cam discs 5, 6 and the ejector rods 10, 13, each ejector rod is provided with a roller 15, 16 which is mounted for rotation on the inner end of the ejector rod and lies against respective cam discs. Owing to the fact that the cam discs 5, 6 are spaced a certain distance apart in the axial direction of the drum, the ejector rods 10 and 13 have

been displaced through a corresponding distance in relation to each other.

A baffle plate **17** is arranged in the drum and securely connected to the shaft **2**. Similar to the shaft **2**, the baffle plate **17** does not accompany the rotary movement of the drum and is curved in a radius corresponding to the inner radius of the drum. The baffle plate is arranged so as to cover the apertures **4** in the recesses **3** along a portion of the periphery of the drum, with the ends of the plate located approximately opposite the cam **8** of the cam disc **5** and the discharge end of a conveyor belt **18** arranged adjacent the drum.

Arranged externally of the drum, immediately adjacent its outer cylindrical surface and opposite the cam **7** of the cam disc **6**, is a holder **19** on which a knife **20** is securely mounted. The knife **20**, which co-acts with the knife **14** on the ejector rods **13** to cut the diapers from the long strip, is secured to the holder with its edge facing and extending transversely of the movement path of the recesses **3** as the drum rotates. The holder is arranged relative the cam disc **6** in a manner such that when an ejector rod **13** is moved outwardly by the cam disc, the knife **14** is moved to partly overlap the knife **20** of the holder.

Arranged at a distance from the holder **19** in the direction of rotation of the drum corresponding to approximately one quarter of a revolution of the periphery of the drum is an applicator **21** intended for applying the securing tabs with protective paper to the absorbent products. The securing tabs, which are indicated with the reference numeral **22** (see FIG. **3**) are rectangular in shape and are gummed on one side thereof to facilitate application thereto of a strip of protective paper **23** with the gummed surface facing the protective paper. The securing tabs are arranged on the protective paper in two parallel rows **24, 25** in a manner such that the short sides of the tabs in the two rows are located opposite each other. The protective paper **23** is divided into four identical parts **26 – 29** separated by three lines **30 – 32** which extend parallel with the longitudinal direction of the long strips and along which the protective paper is weakened to enable it to be torn. The gummed surface of the securing tabs is divided into two regions **33, 34** (FIG. **4**), separated by a gum-free zone extending parallel with the short side of the securing tab.

The applicator **21** comprises two identical units **36** and **37** mounted on one and the same frame structure **38** (FIG. **5**). Each applicator unit comprises a shaft **39** intended to support a storage reel **40** on which a long strip of securing tabs provided with protective paper are intended to be wound, a means **41** for advancing the long strip of securing tabs towards the absorbent products advanced on the drum **1**, means **42** for stripping the inner strips (in FIG. **3** indicated by the reference numerals **27, 28**) of the protective paper from the securing tabs, cutting means **43** for separating the securing tabs and the remaining strips of protective paper **26, 29** (FIG. **3**) from the strip and two applicator heads **44, 45** for seizing the securing tabs provided half way along their length with protective paper and applying the tabs to the absorbent products. Each applicator unit **36, 37** is also provided with means **46** arranged to delay passage of the strip of protective paper **26** provided with securing tabs from the storage reel **40** in relation to the strip **29**, for a reason to be hereinafter described.

Also included in each applicator unit **36, 37** is a photocell **47**, which together with a photocell **48**, which is common to both units, controls the relative positions of absorbent products and the securing tabs and in response thereto, activate the stripping means **42**, the cutting means **43** and the applicator heads **44, 45** at the appropriate point of time. The frame structure **38** of the applicator, which frame structure has the form of an oblong box, extends parallel with the axis of rotation of the drum **1** and transversely across the path of movement of the recesses **3** as the drum rotates, the two applicator units **36, 37** being located on either side of the centre of the movement path. The elements associated with respective applicator units **36, 37** are mounted in the frame structure **38** with the stripping means **42**, the shaft **39**, the photocell **47**, the delay means **46**, the feed means **41**, the cutting means **43** and the parallel applicator heads **44, 45** in that order from the corresponding end wall of the frame **38**. The photocell **48** co-acting with the applicator **21** is arranged adjacent the drum, between the holder **19** and the applicator. The mode of operation of the applicator will now be described in connection with the operation of the apparatus, with reference to an example of a working operation.

FIG. **1** illustrates how the long strip of absorbent products **49**, in the illustrated embodiment diapers, are advanced to the rotating drum **1** from below in a direction tangential to the drum. The diapers are advanced on the aforementioned belt conveyor **18**, the input end of which is connected directly to means (not shown) for manufacturing the diapers. The belt speed of the conveyor **18** and the rotational speed of the drum are adjusted with respect to each other, so that the diapers arrive opposite the recesses **3** in the drum at the discharge end of the conveying belt. The diapers are exposed, via the air permeable perforations **4**, to a subpressure constantly maintained in the interior of the drum by means of the evacuating fan (not shown), the long strip of diapers being continuously transferred from the conveying belt **18** to the rotating drum. When an ejector rod **13** arrives at the cam **7** of the cam disc **6** facing the holder **19** as the drum rotates, the ejector rod is pushed outwardly by the cam disc so that the knives **14** and **20** on the ejector rod and the holder respectively are moved to partly overlap each other (the knife **14** being located on the side of the knife **20** facing the direction of rotation of the drum — see FIG. **2**). By means of the shearing effect obtained between the two knives, the long strip of diapers is cut along a transversely extending line between two adjacent absorbent pads. This working sequence is repeated each time one of the ejector rods **13** passes the holder **19** as the drum rotates. Subsequent to a diaper being separated from the diaper long strip by the knives, the diaper is advanced by the drum to the applicator **21**, for the purpose of applying thereto a securing tab. At the same time, the ejector rod in question is returned by its spring to its inner position, the knife located on the end of the ejector rod being lowered down in the guide structure **12** in the drum.

The point of time at which the cut made in the diaper long strip passes the photocell **48** with rotation of the drum is registered thereby. At the same time, the photocell **47** in the applicator **21** registers the point of time at which it is passed by the portion of the protective paper located between securing tabs. The measurements registered by the photocells **47, 48** are converted

in a known manner, not specifically described here, into electric pulses which are fed to an electronic counter, where they are compared with each other. As a result of the values obtained when making the aforesaid comparisons, continuous output signals are produced by the counter, which signals control, via a relay, the speed at which the protective paper is advanced. By pre-programming the counter, the speed at which the protective paper is advanced can be automatically adjusted to the rotational speed of the drum, so that the gum-free zone **35** (see FIG. 4) on the securing tabs is located substantially opposite the cut between adjacent diapers on the drum when the securing tabs are pressed onto the diapers. FIG. 7 illustrates a row **57** of diapers **58** as they are transported on the drum subsequent to the diapers being separated from each other and provided with securing tabs **22.** By way of illustration, two of the diapers are shown separated from the long strip. The securing tabs are pressed onto the diapers by means of the applicator heads **44, 45** (FIG. 5) hereinafter described.

The securing tabs provided with protective paper are wound as a continuous strip on the reel **40** freely journalled on the shaft **39** in each applicator unit **36, 37.** The two inner protective paper strips **27, 28** are drawn from the roller into the nip between the rolls of the stripping means **42,** which is in parallel relationship to the storage reel. The remainder of the strip comprises the outer protective layer strips **26, 29** and the securing tabs gummed thereto. Of these strips, the strip **29** has been drawn immediately past the photocell **47** and directly to the feed means **41,** while the strip **26** has been drawn to the feed means via the delay means **46.** The delay means comprises a freely journalled roll, which is located on a lower level than the feed path through the feed means. In this way, the strip **26** drawn via the delay means will be advanced in an angular path, which means that the securing tabs advanced in parallel on the roller **40** will be off-set in relation to each other during their passage to the feed means. The roll of the delay means is capable of being displaced vertically on the frame **38** in a manner not further described. The extent to which the securing tabs are off-set with relation to each other can be regulated by adjusting the vertical position of the frame. In the exemplary embodiment, this adjustment is effected automatically in response to the progressively decreasing diameter of the storage reel **40** during operation. The securing tabs carried by the protective paper are drawn from the feed means **41** in two parallel strips and passed via the cutting means **43,** to the applicator heads **44, 45.** Similar to the stripping means **42,** the feed means **41** comprises two parallel rolls journalled for rotation adjacent each other, one of the rolls being driven by a motor. The motor is common to the feed means and to the stripping means, tearing of the strips **27, 28** being synchronised with the forward feed of the strips **26, 29.** The photocells **47** and **48** co-act in a known manner with light sources (not shown).

The cutting means **43** is of conventional type for so-called flying cutting of paper webs, and is illustrated only diagrammatically in the Figures.

The applicator heads **44** and **45** are of identical construction, and are arranged parallel with each other at right angles to the axis of rotation of the drum **1.** Each applicator head vertically movable comprises a yoke **50** (FIG. 6) having the form of an inverted box provided with double bottoms **51, 52.** The yoke is arranged for movement in a reciprocating path, the direction of which forms a right angle to the cylindrical surface of the drum, and is driven in said path by a motor (not shown). Located inside the yoke **50** is a pad **53** of moderately rigid foam plastic material provided with air permeable passages. The pad partially fills the yoke and projects slightly outside the downwardly facing opening of the yoke. The yoke is connected to an evacuating pump (not shown) via a conduit **54,** connected to the space between the bottoms of the yoke, and a number of perforations **55** in the inner bottom of the yoke. The conduit connects the yoke with the drive motor in a conventional manner. A regulating means **56,** which can be actuated electrically from the counter, is arranged on the yoke and enables the space between the bottom of the yoke to be alternately connected with the conduit **54** and the air surrounding the yoke. The regulating means is shown only diagrammatically in the drawing. By alternately connecting the yoke to the pump and the surrounding air by means of the regulating means **56,** the pad **53** is made to alternately provide a suction effect. Operation of the regulating valve is synchronised with the movements of the yoke in a manner such that the suction pad becomes operative slightly before the yoke reaches its upper turning position and remains operative until the yoke is located slightly before the lower turning position. Yoke movements are controlled by the signals on the output side of the counter with respect to the forward feed of the securing tabs, so that the pad **53** exerts a suction effect simultaneously as, or slightly before the corresponding outermost securing tab on the long strip subsequent to having been separated from the long strip, is advanced to a position exactly beneath the pad. As previously mentioned, the movements of the yoke are controlled by the counter also with respect to the forward feed of the diapers, so that the gum-free zone **35** (FIG. 4) on the securing tabs is located opposite the section between the adjacent diapers on the drum when the securing tabs are pressed onto the diapers.

Immediately after separating the securing tabs from respective strips **24, 25,** the tabs are drawn firmly to the suction pad **53** of the applicator head **44, 45** located at that moment at its upper turning position. Since, as the drum rotates, the front long side of a diaper passes the applicator before the rear long side of the diaper, the applicator head **44** is arranged to be activated earlier than the applicator head **45.** For the same reason, the long strip **25** must be applied to the applicator head **44** at a correspondingly earlier point of time than the long strip **24** is applied to the applicator head **45.** This space of time between the two strips is obtained by means of the delay means **46,** as previously described. The movement of the applicator heads **44, 45** is controlled by the counter in response to the rotational speed of the drum **1** and the feed means, tear-off means and cutting means associated with each applicator unit **36, 37.** The elements of the two applicator units and the applicator heads within respective units are, however, also synchronised with each other with respect to the time setting for their respective movements. This synchronisation is also controlled by the counter, firstly so that the sequence of movements of the two units is delayed for a period of time corresponding to the time taken for the diaper on the drum to pass the photocell **48,** and secondly so that the applicator heads of respective units

are actuated successively after each other. In this way, as previously mentioned, the applicator head **44** is activated slightly before it is passed by the edge surface of a diaper facing in the conveying direction while the applicator head **45** is activated slightly before it is passed by the opposite edge surface of the diaper. This coordination of the movements of the four applicator heads enables the securing tabs to be sequentially affixed to the diapers, first on one short end of the diapers and then on the other.

Subsequent to a securing tab being drawn onto the suction pad **53** of the applicator head, the yoke **50** is driven downwardly against the long strip of diapers. When the yoke occupies a position slightly before the lower turning position, the regulating valve **56** is reversed so that the space between the bottoms **51, 52** of the yoke is connected with the outer air. The pressure prevailing in the space between the bottoms thus increases at such a speed that the suction effect of the pad ceases almost immediately. When the yoke and the pad reach the lower turning position, the loosened securing tab is pressed from the pad onto the diaper by the pad as previously described. The diaper then obtains the appearance illustrated in FIG. **7** (in the Figure the row of diapers on the drum are indicated by the reference numeral **57** and the separated diapers by the reference numeral **58**).

Subsequent to attaching the securing pads, the diapers are conveyed by the drum **1** until respective ejector rod **10** reaches the cam **8** of the cam disc **5.**

The ejector rod is then moved outwardly by the cam disc, whereby the diaper located in corresponding recess **3** is ejected from the recess by the rod and caught by a plate **59,** whereafter it is passed by the plate to a conveyor **60** arranged adjacent the drum to convey the diaper to a packeting station (not shown). When the diaper leaves the recess, the apertures **4** in the bottom of the recess remain exposed until covered shortly afterwards by the baffle plate **17** upon continued rotation of the drum **18,** it has passed beyond the baffle plate **17.** Thus, the apertures **4** are again exposed and the recess is prepared to receive a fresh diaper from the conveyor **18.**

Although the invention has been described and illustrated with respect to a specific embodiment thereof, it is not restricted thereto but can be modified within the scope of the concept of the invention. Thus, it is not necessary for the drum to be air-tight or for a subpressure to be maintained in the drum in order to retain the diapers in the recesses thereon. For example, the drum may be completely open at the ends thereof and each recess may be connected to a separate nozzle which in turn is connected, via a central conduit in the drum shaft, to an evacuating fan located externally of the drum.

Neither is it necessary to arrange perforations in the drum in order to fix the diapers thereon, but that the perforations may be replaced with air permeable grid structures placed directly on the cylindrical surface of the drum, in which instance the diapers are retained on the drum solely by the subpressure prevailing on the inner side of the grid structure. In the illustrated embodiment of the apparatus according to the invention, the perforations in the cylindrical surface of the drum have been arranged in the bottom of the recesses. There is nothing to prevent the perforations, however, from being arranged between the recesses. With such a construction, the subpressure will act on the liquid-impermeable layer between the absorbent pads instead of on the pads. Which of these embodiments is chosen is immaterial from the aspect of construction. From the aspect of operation, however, the perforations arranged in the recesses are to be preferred, since fixation of the absorbent pads in the recesses is thus facilitated as a result of the subpressure prevailing therein.

With the illustrated apparatus the two cam discs in the drum are displaced 180° in relation to each other on the drum shaft. The invention, however, is not restricted to this positioning of the cam discs, but the cam displaced at any angle with respect to each other, permitted by the space required for the holder **19,** the applicator **21** and the discharge conveyor **58.**

In the illustrated embodiment, the diapers are cut from the long strip by means of knives. The diapers, however, can be separated from the long strip in other ways, e.g. by punching. In accordance with another embodiment of the apparatus according to the invention, the knives on the holder **19** and the ejector rods **13** have therefore been replaced with a vibration punch and an anvil. The construction with which the diapers are cut from the long strip is preferred, however, since it permits the drum to be rotated at higher speeds than those which can be applied when punching while retaining the position of the diapers on the drum undisturbed.

We claim:

**1.** Apparatus for applying securing tabs to absorbent products conveyed successively as single units attached together in a long strip, said securing tabs being coated on one side with adhesive and having an easily removable protective sheet on the adhesive, comprising, in combination, means for conveying a long strip of absorbent products in one direction; means for conveying securing tabs having an adhesive on one surface continuously and successively in two parallel rows on each side of the strip of absorbent products, each row moving in a direction substantially at a right angle to the strip, at a level higher than and parallel to the strip, with adhesive surfaces turned downward; means for removing a portion of the protective sheet from the adhesive surfaces of the securing tabs in each row to expose such portions of the adhesive surface; means for separating each securing tab from its respective row of securing tabs; and means for applying the exposed adhesive surfaces of the separated securing tabs in pairs to the absorbent products and the portion of the tabs still having a protective sheet thereon extending beyond the corresponding edge of the respective absorbent products.

**2.** An apparatus according to claim **1,** in which the means for applying the securing tabs to the absorbent products comprises a reel for storing rolled-up strips of securing tabs parallel to each other; means for feeding the strips of securing tabs from the reel in two parallel rows towards the strip of absorbent products, and vertically movable applicator means for retaining separated securing tabs and for pressing said tabs onto absorbent products of the long strip.

**3.** An apparatus according to claim **2,** in which the means for removing the protective sheet on the securing tabs comprises two rotatable rolls positioned adjacent each other to form a nip, and in parallel relationship to the storage reel.

4. An apparatus according to claim 2, in which the means for feeding the strips of securing tabs comprises two rotatable rolls positioned adjacent each other at a higher level than the protective means for stripping sheet from the tabs and in parallel relationship to the storage reel and between the reel and the means for conveying the long strip of absorbent products.

5. An apparatus according to claim 1, in which the means for conveying a strip of absorbent products comprises a cylindrical drum mounted for rotation in the vertical plane, and means within the drum for applying a suction force from within the drum surface to retain the strip of absorbent products on the drum.

6. An apparatus according to claim 5, in which the drum is provided with a row of recesses in the cylindrical surface thereof, each of which recesses is adapted to receive one absorbent product unit of the strip.

7. An apparatus according to claim 1, in which the means for separating the securing tabs comprises a shearing or cutting tool.

8. An apparatus according to claim 1, in which the means for applying the securing tabs to the absorbent products comprises a stamp having a downwardly directed, air-permeable stamping pad and a space adjacent thereto, which is connected to means for reducing the pressure in said space.

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