May 10, 1966 W. RUDSZINAT ETAL 3,250,278

APPARATUS FOR APPLYING ADHESIVE-COATED WRAPPERS TO CIGARETTES AND SIMILAR ARTICLES

Filed Dec. 19, 1962 2 Sheets-Sheet 1

Fig. 1

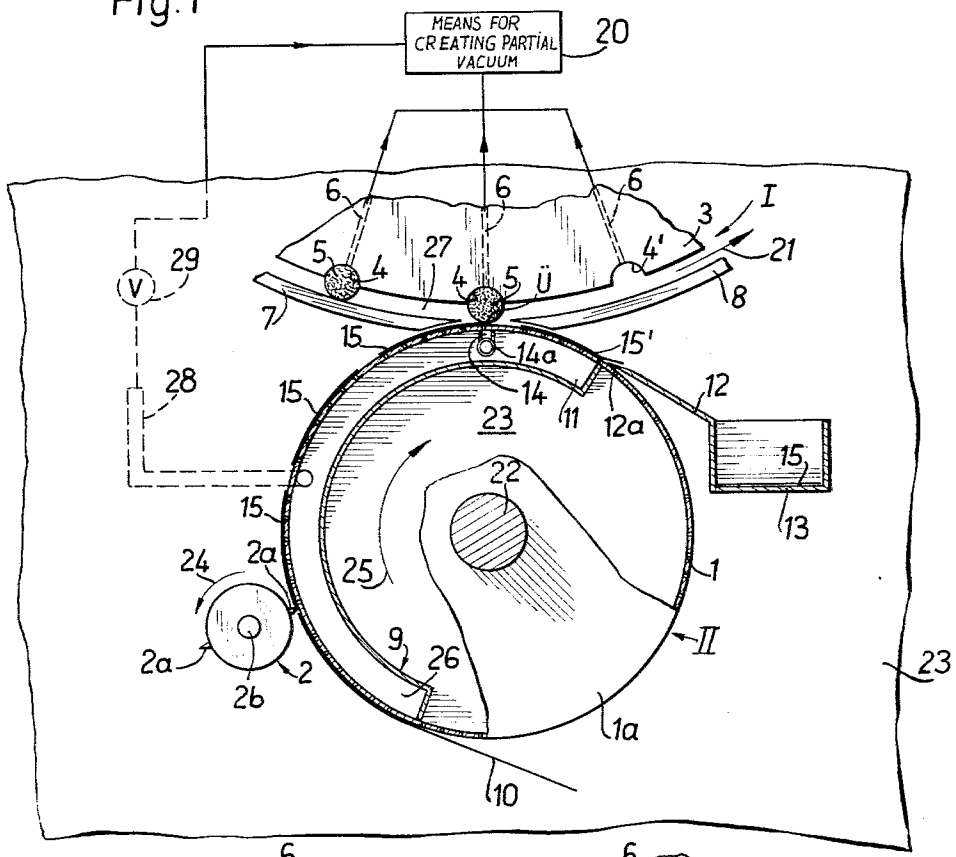


Fig. 2

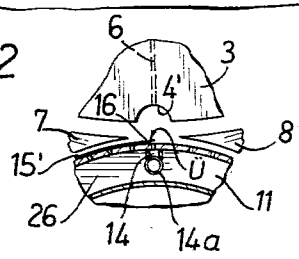
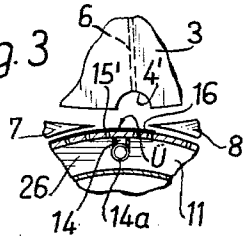


Fig. 3



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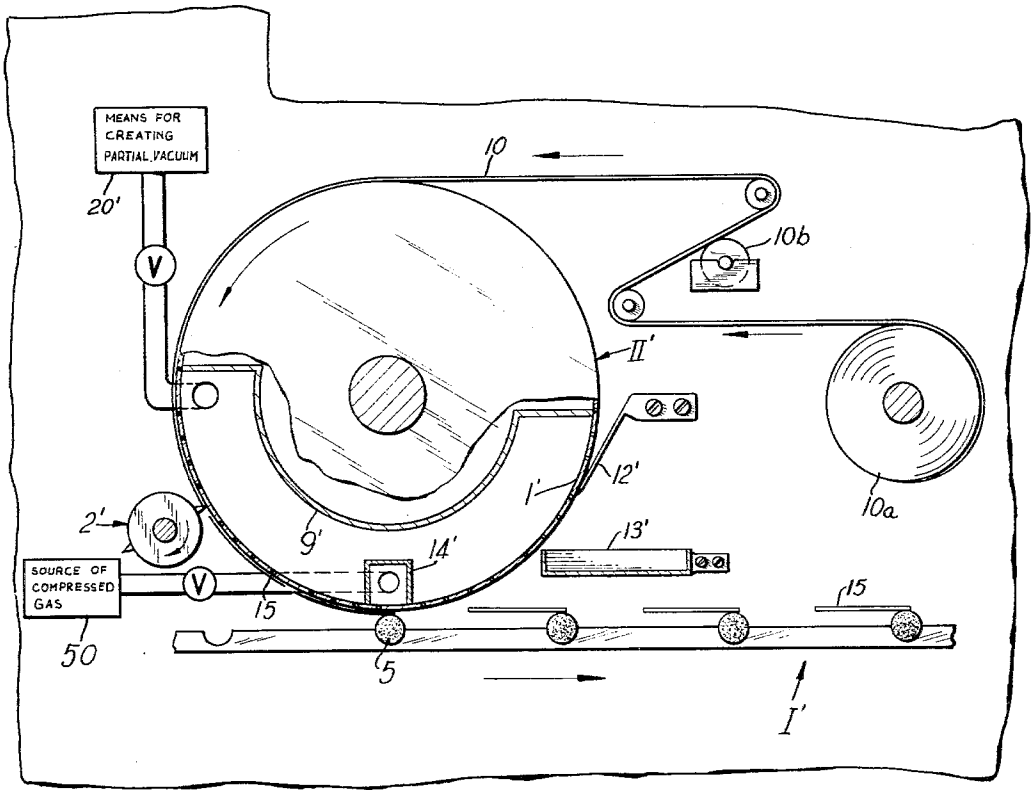


Fig.4

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APPARATUS FOR APPLYING ADHESIVE-COATED WRAPPERS TO CIGARETTES AND SIMILAR ARTICLES

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Claims priority, application Germany, Jan. 2, 1960, H 38,310
11 Claims. (Cl. 131—94)

This application is a continuation-in-part of our application Serial No. 75,772, filed on December 14, 1960, now U.S. Patent No. 3,099,989 granted on August 6, 1963.

The present invention relates to an apparatus for applying adhesive-coated wrappers to elongated rod-like articles, and more particularly to an apparatus which is especially suited for applying adhesive-coated wrappers to groups of end-to-end arranged coaxial cigarettes and filter tips, to groups of end-to-end arranged filter tips, to groups of end-to-end abutting cigarillos and filter tips, and to other articles which, either by themselves or together with additional rod-like articles, constitute tobacco containing products.

It is well known to unite cigarette sticks and filter tips by means of adhesive-coated wrappers which are applied around the abutting end portions of such articles so that each cigarette stick and the respective filter tip form a filter tip cigarette. It is also known to place a filter tip of twice its ultimate length between a pair of coaxial cigarette sticks, to apply a wrapper around the filter tip and around the adjacent end portions of the cigarette sticks, and to thereupon halve the resulting article so that one half of the filter tip and one of the cigarette sticks form a first filter tip cigarette and that the other half of the filter tip and the other cigarette stick form a second filter tip cigarette. However, and insofar as we are informed at this time, all apparatus which are utilized for the application of adhesive-coated wrappers to end-to-end arranged filter tips and cigarette sticks are without any means which would collect non-applied wrappers, i.e., which would remove from the apparatus all such wrappers that, for one or more reasons, failed to meet a group of end-to-end arranged articles and are likely to interfere with the application of other wrappers if they are permitted to remain in the apparatus. The problem of removing non-applied wrappers is especially acute at the time the apparatus is started and when the rate at which the articles are being fed is not always uniform, i.e., it can happen that one or more articles are missing and that the wrappers which were to be applied to such articles will remain in and will soil the component parts of the apparatus.

Accordingly, it is an important object of the present invention to provide an apparatus for consecutively applying adhesive-coated wrappers to groups of end-to-end arranged articles, particularly to groups which include one or two cigarette sticks and a filter tip, and which is provided with exceptionally simple and highly reliable means for collecting all such wrappers that fail to meet a group of articles while they are moved through the apparatus.

Another object of the invention is to provide an apparatus of the just outlined characteristics which is constructed and assembled in such a way that eventual irregularities in the rate at which individual articles or groups of end-to-end arranged articles are being fed cannot interfere with the application of wrappers thereto so that each individual article or each group of articles will receive a wrapper even if the individual articles or groups of articles are not being delivered at identical intervals.

A further object of the invention is to provide a very simple and reliable apparatus for the application of adhesive-coated wrappers to groups of end-to-end arranged rod-like articles and to provide in such apparatus improved suction-operated means for holding the wrappers prior to their application to the respective groups of articles.

An additional object of the invention is to provide an apparatus of the above outlined characteristics which will apply wrappers to meeting ends of cigarette sticks and filter tips or to groups of similar rod-like articles with unvarying accuracy irrespective of the rate of speed at which wrappers and/or groups of articles are being fed thereto.

Still another object of the invention is to provide improved wrapper separating or removing means for use in an apparatus of the above outlined characteristics.

A concomitant object of the invention is to provide an apparatus of the above described type which may be readily installed in conventional filter tip cigarette making machines without necessitating any or by necessitating only minimal adjustments in the construction and/or operation of such machines.

A further object of our invention is to provide an apparatus which not only facilitates but which also assists the transfer of consecutive wrappers to consecutive groups of rod-like articles so that the adhesive substance applied to one side of each wrapper is assisted in causing the wrappers to adhere to the respective groups of articles.

With the above objects in view, the invention resides in the provision of an apparatus for consecutively applying adhesive-coated wrappers of thin paper or the like to elongated rod-like articles, particularly to elongated groups of end-to-end arranged coaxial articles such as a cigarette stick and a filter tip or two spaced cigarette sticks and a twin-length filter tip therebetween. The apparatus comprises first conveying means for advancing the articles in a first elongated path, preferably in such a way that the articles are equidistant from each other and that they advance along the periphery of a circle or arc, second conveying means for advancing the wrappers in a second elongated path which may be an arcuate or a circular path and a so-called transfer portion of which is sufficiently close to the first path to bring about contact between consecutive wrappers and consecutive articles whereby the wrappers automatically adhere to the respective articles and are transferred into the first path, this second conveying means comprising a gas-permeable conveying member having a wrapper-engaging first side and a second side, advancing means for moving the conveying member along the second path, and suction producing means adjacent to the second side of the conveying member. The suction producing means comprises a first and a second section, and these sections are respectively located upstream and downstream of the transfer portion, as seen in the direction in which the conveying member moves along the second path, whereby the first section holds the wrappers against the first side of the conveying member while the wrappers move with the conveying member toward the transfer portion of the second path, and the second section retains at the first side of the conveying member all such wrappers which fail to meet an article at the transfer portion. The apparatus further comprises wrapper collecting means which is adjacent to the first side of the conveying member and to the second section of the suction producing means.

The novel features which are considered as characteristic of the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following detailed description of certain specific embodiments with reference to the accompanying drawings, in which:

FIG. 1 is a fragmentary partly elevational and partly

vertical sectional view of an apparatus which embodies the present invention;

FIG. 2 is a fragmentary detail view of the apparatus, there being shown only that part of the apparatus at which consecutive wrappers are normally caused to adhere to consecutive groups of end-to-end arranged articles, one wrapper being shown on its way toward the transfer portion of the path defined by the second conveying means;

FIG. 3 illustrates the structure of FIG. 2, the wrapper being shown in a different position after it has failed to meet a group of articles at the transfer portion of its path; and

FIG. 4 is a fragmentary partly elevational and partly vertical sectional view of a modified apparatus.

Referring now in greater detail to the drawings, and first to FIG. 1, there is shown an apparatus which is utilized for the application of adhesive-coated wrappers **15** to elongated groups **5** of coaxial filter tips and cigarette sticks which travel in an elongated arcuate path along the periphery of a first conveying means here shown as a rotary conveying drum I. The peripheral portion **3** of this drum is provided with axially parallel equidistant holding means in the form of pockets or grooves **4** each of which normally receives a group **5** and each of which communicates with a radially inwardly extending suction channel **6**. These suction channels are connected to a suitable means **20** for creating partial vacuum to insure that the groups **5** remain in the respective holding means **4** during their advance toward and past the lowermost point of the conveying drum I, this drum being assumed to rotate in an anticlockwise direction, see the arrows **21**. The direction in which the holding means **4** are advanced by the drum I is perpendicular to the longitudinal extensions of the groups **5**.

The apparatus further comprises a second conveying means in the form of a second rotary conveying drum II whose shaft **22** is mounted in a fixed frame member **23** and is driven in a clockwise direction as indicated by the arrow **25**. The drum II comprises a gas-permeable conveying member or mantle **1** in the form of an elongated strip whose wrapper-engaging or wrapper-supporting outer side causes the wrappers **15** to travel in a second elongated arcuate or circular path having an upper most portion Ü which consututes a transfer portion at which consecutive wrappers **15** are normally applied to consecutive groups **5**. It will be noted that the transfer portion Ü of the arcuate path for the wrappers **15** is sufficiently close to the arcuate path of the groups **5** so that a wrapper reaching the transfer portion is caused to adhere to and is thereupon entrained by the respective group into the first path, i.e., into the path in which the groups **5** move past the transfer portion, arrow **21**.

The wrappers **15** are formed by a rotary cutting device **2** which is driven in an anticlockwise direction, arrow **24** (that is, in the same direction as the conveying drum I for the groups **5** but counter to the direction of rotation of the second conveying drum II). The cutting device **2** comprises a pair of radially outwardly extending knives **2***a* which sever a continuous strip or tape **10** of adhesive-coated paper, the latter being paid out by a suitable reel which is not shown in the drawings. It will be readily understood that rotary movements of the drums I, II and of the cutting device **2** are synchronized in such a way that the wrapers **15** are being severed from the tape **10** and that such wrappers are being advanced to the transfer portion Ü at the same rate of speed at which the holding means **4** deliver consecutive groups **5** to this transfer portion. The synchronizing mechanism may be mounted behind the frame member **23** and forms no part of this invention. This frame member also supports the shaft **2***b* of the cutting device **2** and the non-illustrated shaft of the drum I.

The conveying member **1** cooperates with a suction producing means to insure that the wrappers **15** adhere to its outer side while advancing therewith toward and, in some instances, past the transfer portion Ü. The suction producing means comprises a stationary suction chamber **9** which is accommodated in the internal space of the drum II and is adjacent to the inner side of the conveying member **1**. The chamber **9** comprises two freely communicating sections including a larger first section **26** which is located upstream of the transfer portion Ü (i.e., to the left of this portion, as viewed in FIG. 1) and a smaller second section **11** which is located downstream of the transfer portion, it being assumed that the shaft **22** of the drum II serves as a means for advancing the mantle **1** in a clockwise direction which is indicated by the arrow **25**.

As shown in FIG. 1, the peripheral portion **3** of the conveying drum I is surrounded by a guide means including a pair of arcuate shields **7**, **8** which extend toward the opposite sides of the transfer portion Ü and which define with the peripheral portion **3** and arcuate passage **37** for the groups **5**, this passage coinciding with the path in which the groups **5** travel toward, along and past the transfer portion.

In accordance with a feature of the present invention, the apparatus further comprises wrapper collecting means which is adjacent to the outer side of the mandle **1** and to the second section **11** of the suction chamber **9**. This wrapper collecting means comprises an inclined scraper blade **12** whose upper edge portion **12***a* is immediately adjacent to the outer side of the mandle **1** so that it may separate therefrom all such wrappers which are caused to move past the transfer portion Ü. At the lower end of the blade **12**, there is provided a receptacle **13** adapted to collect the wrappers which descend by gravity along the inclined upper side of the scraper blade. The angular distance between the edge portion **12***a* and the transfer portion Ü is less than 90 degrees.

It will be noted that the conveying drums I and II are located in a single vertical plane and that the uppermost point of the lower drum II constitutes the aforementioned transfer portion Ü which is closely adjacent to the lowermost point of the upper drum I.

In accordance with a further feature of the invention, the apparatus comprises a second chamber **14** which is disposed at the inner side of the mantle **1** between the sections **11**, **26** of the suction chamber **9** and which is located opposite the transfer portion Ü. The pressure prevailing in this chamber **14** is higher than the pressure prevailing in the chamber **9** and, as a rule, the chamber **14** communicates with the atmosphere, for example, through a conduit **14***a*, so that its internal space is maintained at or close to atmospheric pressure.

The apparatus of our invention operates in the following manner:

The advancing means including the shaft **22** moves the conveying mantle **1** in a clockwise direction. The suction chamber **9** remains stationary because it is secured to the frame member **23**. The shaft **22** drives the front wall **1***a* of the conveying drum II which is rigid with the mantle **1**. The chamber **9** is communicatively connected with the vacuum creating means **20** by a valved suction conduit **28**. The leading end of the tape **10** is thereupon placed against the outer side of the mantle **1** so that the tape adheres to the mantle owing to suction prevailing in the left-hand section **26** whereby the tape is being paid out and advances toward the revolving cutting device **2** whose knives **2***a* sever therefrom consecutive wrappers **15** which are caused to move along the outer side of the mantle **1** toward the transfer portion Ü. At this transfer portion, the wrappers are brought into contact with consecutive groups **5** and are caused to adhere thereto to be thereupon entrained into the path of the groups **5** (passage **27**) and to advance toward the wrapping station, not shown. Since the pressure prevailing in the second chamber **14** is higher than the pressure pre-

vailing in the chamber 9, the adhesive substance coating the exposed sides of the wrappers will cause consecutive wrappers to adhere to and to be entrained by the respective groups of articles. It is assumed that the wrappers 15 are being applied to groups of articles each of which comprises two cigarette sticks and twin-length filter tip therebetween, and that the width of the wrappers is sufficient to insure that the wrappers adhere substantially tangentially to the entire filter tips and to the adjacent end portions of the respective cigarette sticks, i.e., the wrappers overlap the respective filter tips so that they may be rolled around the filter tips and around the adjacent end portions of the cigarette sticks.

In the event that one of the holding means 4 does not contain a group 5, the corresponding wrapper 15' merely continues to advance along the outer side of the mantle 1 into the range of the suction prevailing in the second section 11 of the chamber 9 and is thereupon "peeled" or scraped off the mantle by the edge portion 12*a* of the inclined blade 12 to descend by gravity into the receptacle 13. This is illustrated in FIGS. 2 and 3 the former of which shows a wrapper 15' in a position it assumes at the time its leading edge portion 16 approaches the transfer portion Ü. This wrapper is intended to adhere to a group 5 which is accommodated in the holding means 4'; however, since the holding means 4' is empty, the wrapper 15' simply continues to travel along and past the transfer portion Ü and remains at the outer side of the mantle 1 owing to suction prevailing in the second section 11 of the chamber 9. Since the second chamber 14 is assumed to be maintained at atmospheric pressure or at a pressure which is slightly less than atmospheric pressure, such pressure cannot cause the wrapper 15' to become separated from the mantle on its way toward the second section 11. In the position of FIG. 3, the leading edge portion 16 of the wrapper 15' is already subjected to suction prevailing in the section 11 so that this leading edge portion passes beneath the shield 8 and advances toward the scraper blade 12.

It will be readily understood that, no matter how advantageous the second chamber 14 might be for satisfactory operation of the apparatus, the provision of this second chamber is an optional feature of our invention. Strictly speaking, the transfer portion Ü of the path in which the wrappers 15 advance along the outer side of the permeable mantle 1 is merely a line which is parallel with the axis of the drum II so that, and particularly if the suction prevailing in the chamber 9 is not strong enough to prevent adherence of wrappers to the respective groups 5, the second chamber 14 may be dispensed with because the adhesive applied to the exposed sides of the wrappers is normally strong enough to overcome the suction and to insure that all such wrappers which meet a group 5 are entrained into the passage 27. The second chamber 14 is of particular advantage when the drums I and II are rotated at very high peripheral speeds at which the wrappers 15 could be separated from the outer side of the mantle 1 under the action of centrifugal force. In such instances, the valve 29 in the suction conduit 28 is adjusted in a sense to reduce the pressure in the first chamber 9 whereby the suction prevailing in the sections 11 and 26 resists the action of centrifugal force. However, despite such increased suction, the wrappers are automatically applied to the respective groups 5 because the pressure prevailing in the second chamber 14 actually assists the adhesive substance in bonding the wrappers to the corresponding groups. If desired, the pressure prevailing in the second chamber 14 may be increased slightly above atmospheric pressure so that the wrappers are actually blown away from the mantle 1 as soon as they reach the transfer portion Ü. For example the pressure prevailing in the chamber 14 may be increased to above atmospheric pressure after the apparatus has been started and at a time it is much less likely that a group 5 would be missing. At any rate,

and provided that the apparatus comprises a second chamber, the pressure prevailing in the chamber 14 should be less than a pressure which would interfere with the application of consecutive wrappers 15 to the respective groups 5.

Owing to the provision of wrapper collecting means 12, 12*a*, 13, the outer side of the mantle 1 remains clean at all times so that the sole force which holds freshly severed wrappers against the mantle is the suction prevailing in the chamber 9.

The apparatus of our invention is equally effective if the path of the groups 5 (see FIG. 4) is a straight linear path as long as the transfer portion of the path in which the wrapers 15 advance is sufficiently close to the path of the groups 5 to cause the wrappers to adhere to the respective groups. In the apparatus of FIG. 4, the groups 5 advance in a straight linear path on a conveyor I', and the wrappers 15 are delivered by the mantle 1' of a drum II'. The tape 10 is being paid out by a reel 10*a* and passes along an adhesive applying roller 10*b* toward a rotary cutting device 2' which severes the wrappers 15. The interior of the drum II' accommodates a suction chamber 9' and a plenum chamber 14' whose function is the same as that of the chambers 9, 14. The apparatus of FIG. 4 also comprises a scraper blade 12' and a receptacle 13'. The suction chamber 9' communicates with a vacuum generating device 20' and the plenum chamber 14' communicates with a source 50 of compressed gas.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it for various applications without omitting features which fairly constitute essential characteristics of the generic and specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. An apparatus for consecutively applying adhesive-coated wrappers to elongated rod-like articles, comprising first conveying means for advancing the articles in a first elongated path; second conveying means for advancing the wrappers in a second elongated path a transfer portion of which is sufficiently close to said first path to bring about contact between consecutive wrappers and consecutive articles whereby the wrappers adhere to and are entrained by the respective articles into said first path, said second conveying means comprising a gas-permeable conveying member having only a single fixed path and a wrapper-engaging first side and a second side, advancing means for moving said conveying member along said fixed path, and suction producing means adjacent to the second side of said conveying member, said suction producing means comprising a first and a second section respectively located upstream and downstream of said transfer portion, as seen in the direction in which said conveying member moves along said fixed path, whereby said first section holds the wrappers against said first side while the wrappers move with the conveying member toward said transfer portion and said second section retains at said first side all such wrappers which, in normal operation of said apparatus, fail to meet an article at said transfer portion; and wrapper collecting means adjacent to the first side of said conveying member and to the second section of said suction producing means, said second section extending downstream to said wrapper collecting means.

2. In an apparatus for consecutively applying adhesive-coated wrappers to elongated rod-like articles, in combination, first conveying means for advancing the articles in a first elongated path; second conveying means for advancing the wrappers in a second elongated path a transfer portion of which is sufficiently close to said first path to bring about contact between consecutive wrappers

and consecutive articles whereby the wrappers adhere to and are entrained by the respective articles into said first path, said second conveying means comprising a gas-permeable conveying member having only a single fixed path and a wrapper-engaging first side and a second side, advancing means for moving said conveying member along said fixed path, and suction producing means adjacent to the second side of said conveying member, said suction producing means comprising a first and a second section respectively located upstream and downstream of said transfer portion, as seen in the direction in which said conveying member moves along said fixed path, whereby said first section holds the wrappers against said first side while the wrappers move with the conveying member toward said transfer portion and said second section retains at said first side all such wrappers which, in normal operation of said apparatus, fail to meet an article at said transfer portion; and means for removing from said conveying member the wrappers retained by said second section of said suction producing means and said second section extending downstream to said wrapper removing means.

3. An apparatus for consecutively applying adhesive-coated wrappers to elongated groups of end-to-end arranged coaxial rod-like articles, particularly to end-to-end arranged cigarette sticks and filter tips, said apparatus comprising first conveying means for advancing the groups of articles in a first arcuate path and in a direction substantially at right angles to the longitudinal extensions of the groups of articles; second conveying means for advancing the wrappers in a second arcuate path a transfer portion of which is sufficiently close to said first path to bring about contact between consecutive wrappers and consecutive groups of articles whereby the wrappers adhere to and are entrained by the respective groups of articles into said first path, said second conveying means comprising a gas-permeable conveying member having a wrapper-engaging first side and a second side, advancing means for moving said conveying member along said second path, and suction producing means adjacent to the second side of said conveying member, said suction producing means comprising a suction chamber including a first and a second section respectively located upstream and downstream of said transfer portion, as seen in the direction in which said conveying member moves along said second path, whereby said first section holds the wrapers against said first side while the wrappers move with the conveying member toward said transfer portion and said second section retains at said first side all such wrappers which, in normal operation of said apparatus, fail to meet a group of articles at said transfer portion; and a second chamber located at the second side of said conveying member intermediate said first and second sections and opposite said transfer portion, the pressure prevailing in said second chamber being such that wrappers moving along said transfer portion may adhere to and may be entrained by the respective groups of articles into said first path.

4. An apparatus for consecutively applying adhesive-coated wrappers to elongated groups of end-to-end arranged coaxial rod-like articles, particularly to end-to-end arranged cigarette sticks and filter tips, said apparatus comprising first conveying means for advancing the groups of articles in a first arcuate path and in a direction substantially at right angles to the longitudinal extensions of the groups of articles; second conveying means for advancing the wrappers in a second arcuate path a transfer portion of which is sufficiently close to said first path to bring about contact between consecutive wrappers and consecutive groups of articles whereby the wrappers adhere to and are entrained by the respective groups of articles into said first path, said second conveying means comprising a gas-permeable conveying member having a wrapper-engaging first side and a second side, advancing means for moving said conveying member along said second path, and suction producing means adjacent to the second side of said conveying member, said suction producing means comprising a suction chamber including a first and a second section respectively located upstream and downstream of said transfer portion, as seen in the direction in which said conveying member moves along said second path, whereby said first section holds the wrappers against said first side while the wrappers move with the conveying member toward said transfer portion and said second section retains at said first side all such wrappers which, in normal operation of said apparatus, fail to meet a group of articles at said transfer portion; a second chamber located at the second side of said conveying member intermediate said first and second sections and opposite said transfer portion, the pressure prevailing in said second chamber being such that wrappers moving along said transfer portion may adhere to and may be entrained by the respective groups of articles into said first path; and wrapper collecting means adjacent to the first side of said conveying member and to the second section of said suction chamber.

5. An apparatus for consecutively applying adhesive-coated wrappers to elongated groups of end-to-end arranged coaxial rod-like articles, particularly to end-to-end arranged cigarette sticks and filter tips, said apparatus comprising first conveying means for advancing the groups of articles in a first arcuate path and in a direction substantially at right angles to the longitudinal extensions of the groups of articles; second conveying means for advancing the wrappers in a second arcuate path a transfer portion of which is sufficiently close to said first path to bring about contact between consecutive wrappers and consecutive groups of articles whereby the wrappers adhere to and are entrained by the respective groups of articles into said first path, said second conveying means comprising a gas-permeable conveying member having a wrapper-engaging first side and a second side, advancing means for moving said conveying member along said second path, and suction producing means adjacent to the second side of said conveying member, said suction producing means comprising a suction chamber including a first and a second section respectively located upstream and downstream of said transfer portion, as seen in the direction in which said conveying member moves along said second path, whereby said first section holds the wrappers against said first side while the wrappers move with the conveying member toward said transfer portion and said second section retains at said first side all such wrappers which, in normal operation of said apparatus, fail to meet a group of articles at said transfer portion; a second chamber located at the second side of said conveying member intermediate said first and second sections and opposite said transfer portion; and a source of compressed gas connected to said second chamber so that pressure prevailing in said second chamber exceeds atmospheric pressure whereby wrappers moving along said transfer portion are compelled to adhere to and are entrained by the respective groups of articles into said first path.

6. An apparatus for consecutively applying adhesive-coated wrappers to elongated rod-like articles, comprising first conveying means for advancing the articles in a first elongated path; second conveying means for advancing the wrappers in a second elongated path a transfer portion of which is sufficiently close to said first path to bring about contact between consecutive wrappers and consecutive articles whereby the wrappers adhere to and are entrained by the respective articles into said first path, said second conveying means comprising a gas-permeable conveying member having only a single fixed path and a wrapper-engaging first side and a second side, advancing means for moving said conveying member along said fixed path, and suction producing means adjacent to the second side of said conveying member, said suction producing means comprising a first and a second section respectively located upstream and downstream of said transfer portion, as seen in the direction in which said conveying

member moves along said fixed path, whereby said first section holds the wrappers against said first side while the wrappers move with the conveying member toward said transfer portion and said second section retains at said first side all such wrappers which, in normal operation of said apparatus, fail to meet an article at said transfer portion; and wrapper collecting means adjacent to the first side of said conveying member and to the second section of said suction producing means, said second section extending downstream to said wrapper collecting means and said wrapper collecting means comprising a scraper blade having an edge portion immediately adjacent to the first side of said conveying member for separating therefrom wrappers which are moved beyond said transfer portion.

7. An apparatus as set forth in claim 6, wherein said wrapper collecting means further comprises a receptacle adjacent to said scraper blade, said scraper blade being located in an inclined plane with said edge portion at the upper end thereof and with said receptacle at the lower end thereof so that wrappers separated by said edge portion descend by gravity into said receptacle.

8. An apparatus as set forth in claim 7, wherein said second path is a circular path which is located in a vertical plane and wherein said transfer portion is located at the uppermost point of said circular path, the angular distance between said transfer portion and the edge portion of said blade being less than 90 degrees.

9. An apparatus for consecutively applying adhesive-coated wrappers to elongated groups of end-to-end arranged coaxial articles, particularly to groups of end-to-end arranged cigarette sticks and filter tips, said apparatus comprising a first rotary conveying drum having a plurality of equidistant axially parallel peripheral holding means each of which may receive a group of articles, said drum being located in a vertical plane; a second rotary conveying drum having only a single fixed axis and defining an internal space and comprising a gas-permeable mantle having a wrapper-supporting outer side and an inner side, said second drum being located in a vertical plane beneath and being so closely adjacent to said first drum that a wrapper supported by the uppermost portion of the outer side of said mantle is caused to adhere to and is thereupon entrained by that group of articles which is received in the holder means momentarily located at the lowermost point of said first drum; suction chamber means adjacent to the inner side of said mantle, said suction chamber means comprising a first section located at one side of the uppermost portion of said mantle and a second section located at the other side of said uppermost portion, said drums rotating in opposite directions and said second drum rotating in such direction that wrappers supported by the outer side of said mantle first travel along said first section toward said uppermost portion to adhere to consecutive groups of articles, and that any wrappers which, in normal operation of said apparatus, fail to meet a group of articles at said uppermost portion thereupon travel along said second section to be retained against the outer side of said mantle; and wrapper collecting means adjacent to the outer side of said mantle and to the second section of said suction chamber, said second section extending downstream to said wrapper collecting means.

10. An apparatus for consecutively applying adhesive-coated wrappers to elongated rod-like articles, comprising first conveying means for advancing the articles in a first elongated path; second conveying means for advancing the wrappers in a second elongated path a transfer portion of which is sufficiently close to said first path to bring about contact between consecutive wrappers and consecutive articles whereby the wrappers adhere to and are entrained by the respective articles into said first path, said second conveying means comprising a gas-permeable conveying member having only a single fixed path and a wrapper-engaging first side and a second side, advancing means for moving said conveying member along said fixed path, and suction producing means adjacent to the second side of said conveying member, said suction producing means comprising a first and a second section respectively located upstream and downstream of said transfer portion, as seen in the direction in which said conveying member moves along said fixed path, whereby said first section holds the wrappers against said first side while the wrappers move with the conveying member toward said transfer portion and said second section retains at said first side all such wrappers which, in normal operation of said apparatus, fail to meet an article at said transfer portion, said sections communicating with each other; and wrapper collecting means adjacent to the first side of said conveying member and to the second section of said suction producing means, said second section extending downstream to said wrapper collecting means.

11. In an apparatus for consecutively applying adhesive-coated wrappers to elongated rod-like articles, in combination, conveying means for advancing the wrappers in an elongated path at a transfer portion of which consecutive wrappers are applied to and are entrained by the respective articles from said path, said conveying means comprising a gas-permeable conveying member having only a single fixed path and a wrapper-engaging first side and a second side, advancing means for moving said conveying member along said fixed path, and suction producing means comprising a first and a second section respectively located upstream and downstream of said transfer portion, as seen in the direction in which said conveying member moves along said fixed path, whereby said first section holds the wrappers against said first side while the wrappers move with the conveying member toward said transfer portion and said second section retains at said first side all such wrappers which, in normal operation of said apparatus, fail to meet an article at said transfer portion; and wrapper collecting means adjacent to said first side of said conveying member and to said second section, said second section extending downstream to said wrapper collecting means.

References Cited by the Examiner

UNITED STATES PATENTS

2,165,144	7/1939	Lubbock	131—94
2,808,059	10/1957	Stelzer	131—94
2,866,464	12/1958	Stone	131—94 X
2,873,719	2/1959	Schubert.	
2,882,970	4/1959	Schur.	
2,902,040	9/1959	Korber et al.	131—94

FOREIGN PATENTS

286,421	3/1928	Great Britain.
768,489	2/1957	Great Britain.

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