



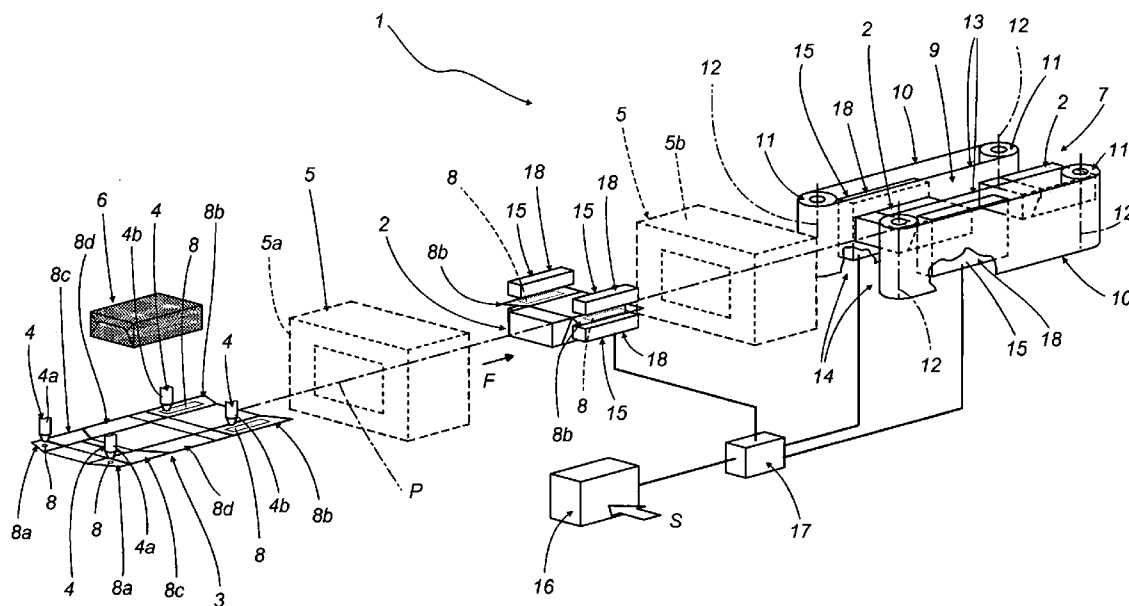
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(19) **United States**(12) **Patent Application Publication****Ghini et al.**(10) **Pub. No.: US 2006/0207224 A1**(43) **Pub. Date: Sep. 21, 2006**(54) **METHOD AND A DEVICE FOR THE
ASSEMBLY OF PACKETS FOR TOBACCO
PRODUCTS****Publication Classification**(51) **Int. Cl.**
B65B 11/06 (2006.01)(52) **U.S. Cl.** **53/466; 53/228**(76) Inventors: **Marco Ghini**, San Lazzaro Di Savena
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Reno (IT)(57) **ABSTRACT**

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Cigarette packets are assembled by a method that involves dabbing or spraying a cold-setting adhesive onto selected areas of a blank fed along the wrapping line of a packaging machine, whereupon the blank is folded to form a packet; should there be a break in operation of the machine following the application of the adhesive, persisting for a certain length of time, the method includes a heat-reactivation step whereby the adhesive applied previously to the blank is warmed to a given temperature so as to restore its bonding properties and guarantee the ultimate stability of the assembled packet.



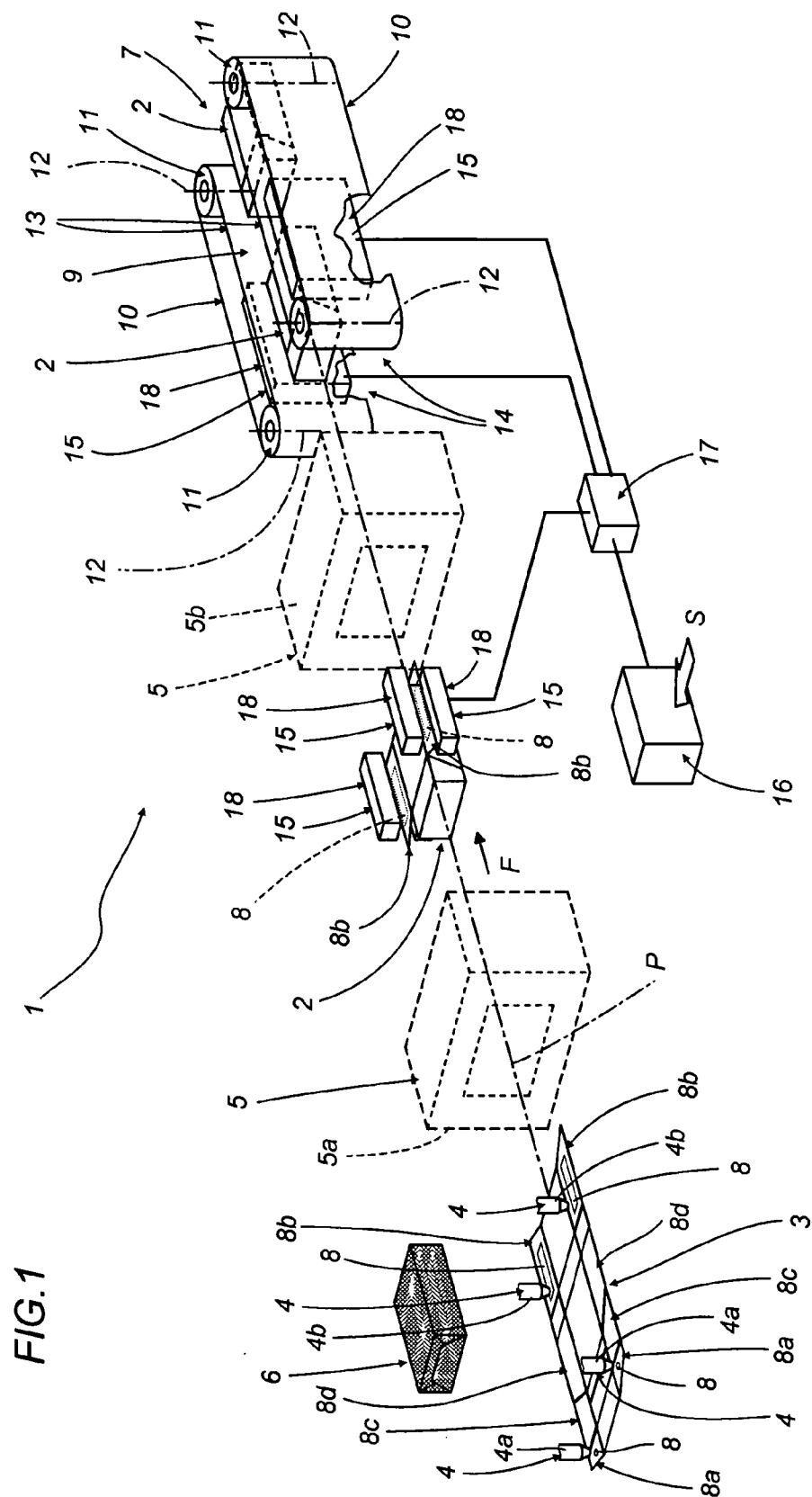
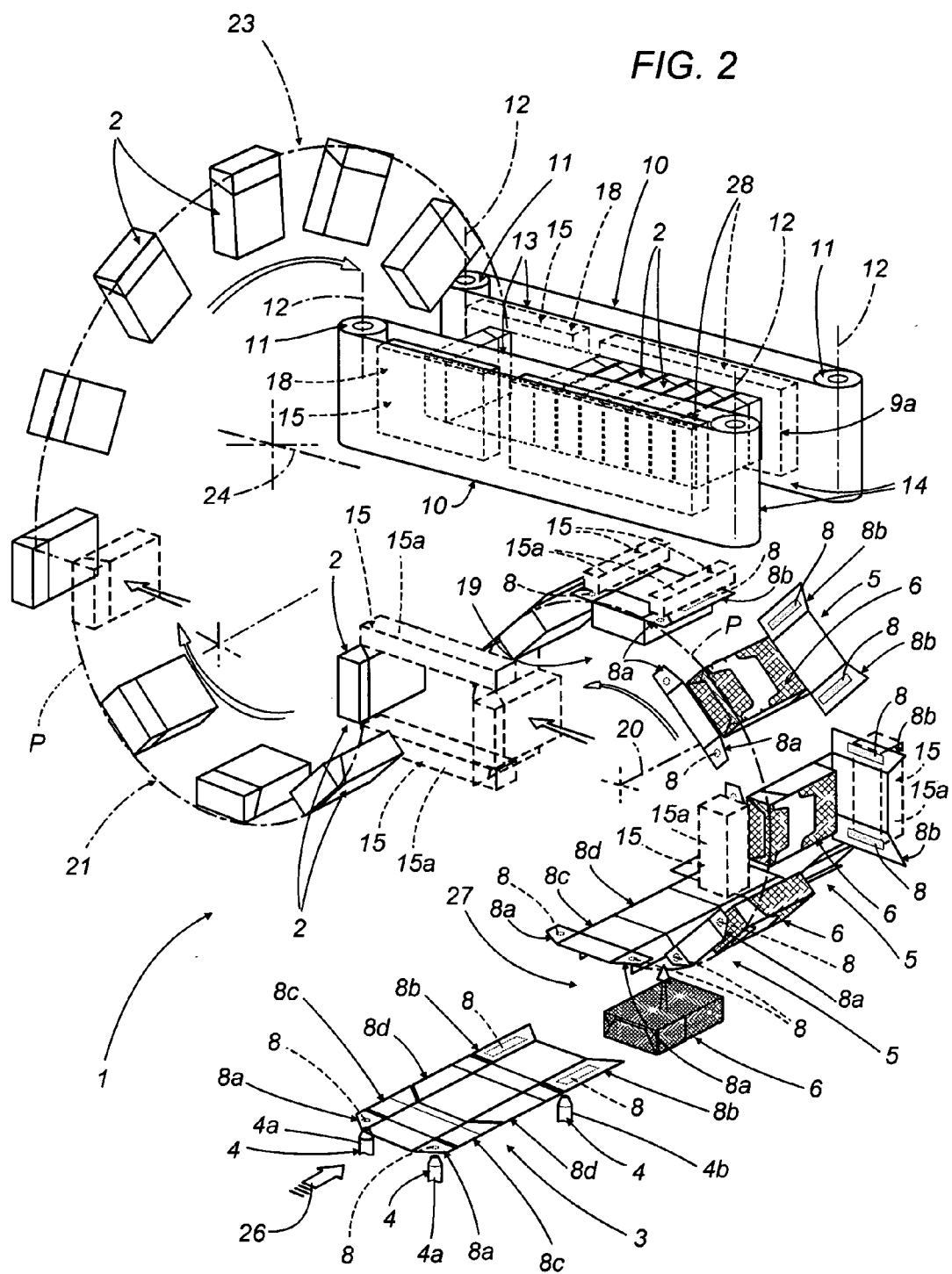


FIG. 2



METHOD AND A DEVICE FOR THE ASSEMBLY OF PACKETS FOR TOBACCO PRODUCTS

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a method and a device for the assembly of packets for tobacco products.

[0002] Cigarette packets are composed conventionally of an inner wrapper, substantially parallelepiped in shape, fashioned generally from metal foil paper and enveloping a group of cigarettes, for example twenty in number, and an outer wrapper that can be either of rigid or of soft type.

[0003] In the case of a rigid packet, which typically has a hinged lid, the outer wrapper is fashioned from a flat diecut blank of paperboard prepared with longitudinal and transverse crease lines and cuts serving to delimit a plurality of panels and flaps that will combine, after a succession of folding operations, to form the structure of the outer wrapper.

[0004] In the case of a soft packet, the outer wrapper is again fashioned by completing a succession of folding operations, in this instance on a sheet of pliable paper separated by a cutting operation from a continuous strip decoiled from a respective roll.

[0005] Machines of prior art type able to manufacture such packets comprise a wrapping line equipped with infeed stations supplying the blanks or the sheets of paper, a station at which groups of cigarettes enveloped each in a relative inner wrapper of metal foil paper are taken up and paired with respective blanks or sheets of paper, a plurality of folding stations, and outfeed conveyor means from which the finished packets pass on to further machines.

[0006] Such machines are equipped with gluing devices, upstream of the folding means, that will spread or spray an adhesive substance onto selected portions of the wrapping material.

[0007] With the folding steps completed, the adhesive dries to the point of setting and the outer wrapper can thus be rendered stable.

[0008] Conventionally, where the adhesive employed is a cold-setting type, such as a vinyl or similar glue, it will require a certain length of time to dry to the point of setting, and accordingly, to ensure the outer wrapper can be properly stabilized during the course of this drying and setting interval, the packets must be subjected to the action of suitable restraint means, applied at least to the areas that have been glued.

[0009] To this end, the finished packets emerging from the aforementioned wrapping line can be directed, for example, along an outfeed channel consisting typically in pair of conveyor belts, each looped around two respective return pulleys of which one at least is power driven. The active branches of the two belts are offered in contact to the flank faces of the assembled packet and extend mutually parallel, delimiting the aforementioned outfeed channel and functioning as the restraint means. In addition, the machine will generally incorporate heated metal plates breasted with the reverse sides of the active branches, so that the flank faces of the packets, glued previously with the cold-setting adhesive, can be warmed in such a way as to bring about the

curing process (evaporation of water) and the resulting stabilization of the outer wrapper more quickly.

[0010] In the event of a break in production occurring and the machine being brought to a standstill, so that the time elapsing from the moment when the adhesive is applied to the moment when the glued portions are bent and joined becomes long enough for the bonding properties of the adhesive to be degraded, the packets emerging from the restraint means may lose their stability and certain of the glued and joined parts may separate and lift, with the result that the packets are rendered defective and must be discarded.

[0011] The object of the present invention is to provide a method and a device for use in the assembly of packets containing tobacco products, such as will be unaffected by the drawbacks described above.

[0012] One particular object of the invention is to set forth a method and a device used in the assembly of packets for tobacco products such as will guarantee that all packets assembled are guaranteed free of gluing defects, regardless of any machine stoppages attributable, for example, to technical problems or maintenance requirements.

SUMMARY OF THE INVENTION

[0013] The stated objects are realized according to the present invention in a method of assembling packets for tobacco products directed along the wrapping line of a packaging machine. The method disclosed is applicable to a machine equipped with feed means supplying a wrapping material from which the packets are made, and includes the steps of applying a layer or dab of cold-setting adhesive to predetermined areas of the wrapping material, folding the wrapping material to form a packet, then reactivating the cold-setting adhesive applied to the predetermined areas by exposing these same areas to heat at a predetermined reactivation temperature.

[0014] The aforementioned objects are realized similarly in a device according to the invention for the assembly of packets around tobacco products, comprising feed means by which a wrapping material is advanced along a wrapping line of a packaging machine, means by which to apply a layer or a dab of cold-setting adhesive to predetermined areas of the wrapping material, and folding means by which the wrapping material is formed into a packet; the device further comprises heater means serving to reactivate the cold-setting adhesive applied to the predetermined areas by exposing these same areas to heat at a predetermined reactivation temperature.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The invention will now be described in detail, by way of example, with the aid of the accompanying drawings, in which:

[0016] **FIG. 1** illustrates a portion of a wrapping line on which packets for tobacco products are assembled by the method according to the present invention, viewed schematically and in perspective;

[0017] **FIG. 2** shows a constructional example of the line in **FIG. 1**.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] With reference to the drawings, numeral **1** denotes a portion of a wrapping line, in its entirety, on which packets **2** for tobacco products are assembled in a packaging machine.

[0019] The wrapping line follows a predetermined path **P** along which sheets **3** of wrapping material, referred to commonly as blanks, or diecuts, are caused to advance in succession by suitable feed means of conventional embodiment (not illustrated in the drawings), following a feed direction denoted **F**.

[0020] Located along the aforementioned wrapping path **P** are components **4** serving to apply a layer or dab of cold-setting adhesive, denoted **8**, on selected areas of the wrapping material, and folding means **5** such as will fashion an enclosed packet about a relative group **6** of cigarettes already enveloped, typically, in a leaf of metal foil paper.

[0021] In the example of **FIG. 1**, the wrapping line **1** passes through a first and a second folding station illustrated schematically as two blocks **5a** and **5b**, positioned in sequence along the line **1**, and on toward an outfeed stage **7** from which the finished packet **2** emerges.

[0022] The components **4** serving to apply layers or dabs of adhesive **8**, which might consist in contact or spray type gluing devices, are shown in the example of **FIG. 1** as two pairs of gluing nozzles **4a** and **4b** positioned above the wrapping line and in such a way that a blank **3** passing beneath can be sprayed with adhesive on respective first lateral flaps **8a** and second lateral flaps **8b** that will be associated with further corresponding flaps **8c** and **8d** when the blank is folded.

[0023] After the nozzles **4a** and **4b** have deposited the cold-setting adhesive **8**, the group **6** of cigarettes is placed on the blank **3** and directed thus into the first folding station **5a**, whereupon the blank **3** is closed around the group **6** of cigarettes in familiar manner, neither described nor illustrated, except for the glued second lateral flaps **8b**, which will be bent and secured to the corresponding flaps **8d** at the second folding station **5b**.

[0024] The wrapping line **1** further comprises an outfeed channel **9** placed to take up the finished packets **2** downstream of the folding means **5** and embodied as a pair of conveyor belts **10** each looped around two respective return pulleys **11** turning on vertical axes **12**, of which one at least is power driven.

[0025] The active branches **13** of the two belts **10** placed in contact with the flanks of the packets **2** extend parallel one with another, delimiting the outfeed channel **9** and functioning as restraint means **14** by which the packets **2** are held firmly in such a way as to stabilize the outer wrapper satisfactorily.

[0026] The device according to the present invention comprises heater means **15** of which the function is to reactivate the cold-setting adhesive **8** applied to the aforementioned predetermined areas of the blank, in particular when the operating cycle of the packaging machine is interrupted for a given interval of time **T**, long enough for the bonding properties of the cold-setting adhesive to be lost yet short enough for the loss to be reversible by means of a heat-reactivation step.

[0027] With this end in view, the adhesive is warmed up to a predetermined reactivation temperature t_r , at which it regains the bonding properties lost during the break in the operating cycle of the machine.

[0028] More precisely, the device disclosed comprises processing means **16** such as will measure the time **T** elapsing in the event of a machine stoppage, when in receipt of a warning signal **S** from a device (not shown in the drawings) connected to the packaging machine and able to generate a start signal and a stop signal indicating the start and finish of a break in the operating cycle of the machine.

[0029] The processing means **16** consist in metering means able to measure the duration of the stoppage when the machine is idle, and are connected to the heat reactivation means **15** by way of a control unit **17** governing the operation of these same means **15**.

[0030] In particular, the stoppage time **T** is compared by the processing means **16** with a first predetermined critical time value **T1** indicating that the adhesive will have lost its bonding properties and needs to be reactivated, and with a second predetermined critical time **T2** indicating that the adhesive will have deteriorated beyond recovery and even the heat-reactivation step is no longer of any use.

[0031] Should the measured stoppage time **T** fall between the first and second predetermined critical time values **T1** and **T2**, then the processing means **16** will respond by piloting the control unit **17** to initiate the heat reactivation step.

[0032] In the preferred solution of **FIG. 1**, the step of heat-reactivating the cold-setting adhesive **8** is initiated after the folding step and concurrently, at least in part, with the restraint step. To this end, the heat-reactivation means **15** are associated with the restraint means **14**.

[0033] In particular, the heat-reactivation means **15** comprise heated metal plates **18** breasted with the active branches **13** of the two belts **10**, on the reverse side. Thus, the heat-reactivation step is brought about by associating heated restraining elements with each of the formed packets **2**.

[0034] The method according to the invention might also include a cooling step, implemented following the step of reactivating the cold-setting adhesive **8** by the application of heat so as to avoid degrading the packet **2** and the warmed adhesive, through the agency of cooling plates installed in series with the heated plates **18** and breasted with the reverse faces of the active branches **13**. The plates could operate at ambient temperature, by way of example, or could be suitably cooled.

[0035] Finally, the wrapping line could also incorporate means by which to dry the packets **2**, downstream of the heat-reactivation means **15**.

[0036] The drying means, conventional in embodiment and therefore not illustrated, will comprise further plates dedicated to the drying step, located beyond the heated plates **18** and, if installed, the cooling plates.

[0037] Such drying plates would be breasted likewise with the active branches **13** of the belts **10** dedicated to heat-reactivation of the adhesive, on the reverse side, or alternatively mounted to other belts located further along the wrapping line.

[0038] The drying plates operate at a temperature t_d lower than the reactivation temperature t_r of the heated plates 18.

[0039] In an alternative solution, not illustrated, the drying plates and the heated plates 18 could be one and the same, operating at different temperatures controllable selectively according to whether the plates are being utilized at a given moment to dry or to reactivate the adhesive 8.

[0040] Alternatively, or in addition, to the elements described above, the means 15 for heat-reactivation of the adhesive can be positioned upstream of the folding means 5, coming into operation before the folding step, or, if the folding means 5 comprise a plurality of folding stations 5a and 5b as in the example of FIG. 1, the heat-reactivation means 15 can be positioned, additionally or alternatively, between one folding station 5a and the next folding station 5b.

[0041] The positioning and number of heat-reactivation means 15 will depend in any event on the effective structure of the device and the interval of time elapsing between application of the cold-setting adhesive to the predetermined areas of the blank, and subsequent association of these same areas with the respective areas to which they are bonded.

[0042] The heat-reactivation step could also be brought about by exposing the areas dabbed or sprayed with adhesive to convection, directing hot air from a convector heater, for example, or to radiated heat issuing from a suitable source.

[0043] In the example of FIG. 2, the final part of the wrapping line is equipped with a wrapping wheel 19 set in rotation about a first horizontal axis 20, a conveyor and reject wheel 21 located substantially tangential to the wrapping wheel 19 and rotatable about a second horizontal axis 22, also a drying wheel 23 rotatable about a third horizontal axis 24 and an outfeed channel 9a similar in all respects to the outfeed channel 9 of FIG. 1.

[0044] The channel 9a in question extends substantially parallel to the third horizontal axis 24 and is positioned on the same side of the drying wheel 23 as the wrapping and reject wheels 19 and 21.

[0045] The wrapping wheel 19 is supplied with diecut blanks 3 advanced singly and in succession by feed means indicated schematically by an arrow 26, each slotted radially into a respective radial cavity or pocket (not illustrated) of the wheel 19, together with a respective group 6 of cigarettes.

[0046] Advancing on the wrapping wheel 19, the blanks 3 are directed from an infeed station 27 through a plurality of folding stations 5, at which each one is bent by steps around the respective group 6 of cigarettes and secured in the folded position by means of the cold-setting adhesive, applied by two pairs of gluing nozzles 4a and 4b similar to those already described above with reference to FIG. 1.

[0047] In the example of FIG. 2, the nozzles 4a and 4b are positioned beneath the predetermined path P and designed thus to spread the adhesive 8 on a blank 3 as it passes above.

[0048] The folding steps performed on the blank 3 are completed in such a way that the packet arrives at the outfeed channel 9 in the finished state.

[0049] The wrapping, reject and drying wheels 19, 21 and 23 are set in rotation by an indexing device not illustrated in the drawings, and the transfer of the packets 2 from one wheel to another takes place with the two wheels motionless.

[0050] The aforementioned heat-reactivation means 15 are positioned next to the wrapping wheel 19 and/or to the outfeed channel 9a.

[0051] The wrapping line of FIG. 2 is equipped with cooling plates 28 of the type mentioned previously, though not indicated in FIG. 1, installed along the outfeed channel 9a in sequence with the heated plates 18.

[0052] Also illustrated in FIG. 2, by way of example, are a plurality of heating elements 15a located at several points along the circumferential path of the wrapping wheel 19, albeit in practice a limited number of such elements could be adopted, according to requirements, shaped and proportioned to match the glued areas of the blank 3 that need heating. The heating elements 15a are placed in such a way that, as the blank 3 advances and folds partially around the group 6 of cigarettes, the predetermined areas on which adhesive 8 has been deposited will pass in close proximity to the positions occupied by the elements 15a and receive the heat emitted by them.

[0053] It will be evident from the foregoing that the method and the device according to the invention are able to guarantee the successful gluing and stabilization of packets even in the event of breaks in production occurring.

[0054] In effect, by warming the glued portions of the outer wrapper, after the formation of the packet, or between the step of applying the adhesive and the subsequent folding step, it becomes possible to recover the bonding properties of the adhesive when lost due to a break in production and thus ensure that all of the packets are securely bonded.

[0055] With the method and the device according to the invention, accordingly, the proportion of defective packets rejected as presenting unstuck folds can be considerably reduced, if not totally eliminated.

[0056] In an alternative embodiment of the invention, the adhesive 8 could be heat-reactivated utilizing means 15 that remain permanently in operation, even during normal operation of the packaging machine, in such a manner that all packets 2 turned out by the machine can be conditioned at the reactivation temperature t_r . In this instance the wrapping line will be set up so that all the packets 2 have time to cool sufficiently, following the application of heat, before being distanced from the elements (the belts 10, for example) that serve to stabilize the glued outer wrapper.

1. A method of assembling packets for tobacco products directed along a wrapping line (1) of a packaging machine equipped with feed means supplying a wrapping material (3) from which the packets (2) are made, including the step of applying a layer or dab of cold-setting adhesive (8) to predetermined areas (8a, 8b) of the wrapping material (3), and the step of folding the wrapping material (3) to form a packet, characterized in that it further includes at least one step of reactivating the cold-setting adhesive (8) applied to the predetermined areas (8a, 8b), by exposing the selfsame areas to heat, at a predetermined reactivation temperature (t_r).

2. A method as in claim 2, including a cooling step following the heat-reactivation step.

3. A method as in claim 1, wherein the heat-reactivation step is implemented on all packets (2) assembled by the packaging machine.

4. A method as in claim 1, wherein the heat-reactivation step is initiated following a break in operation of the packaging machine lasting for a predetermined interval of time (T1-T2).

5. A method as in claim 1 including a step, following the folding step, of restraining the packets (2), wherein the step of reactivating the cold-setting adhesive (8) by exposure to heat occurs concurrently, at least in part, with the restraining step.

6. A method as in claim 1, wherein the heat-reactivation step is implemented by means of heated restraint elements.

7. A method as in claim 1, wherein the heat-reactivation step precedes the folding step.

8. A method as in claim 1, wherein the heat-reactivation step occurs during the course of the folding step.

9. A method as in claim 7, wherein the heat-reactivation step is implemented by radiating heat on the predetermined areas (8a, 8b) to which the cold-setting adhesive (8) has been applied.

10. A method as in claim 1, wherein the heat-reactivation step occurs as the wrapping material (3) advances along the wrapping line (1).

11. A method as in claim 1, further including the steps of measuring the length of time (T) elapsing during a break in operation of the packaging machine, and comparing the resulting stoppage time (T) with the predetermined interval of time (T1-T2) between a first predetermined critical time value (T1) and a second predetermined critical time value (T2), within which any degradation of the cold-setting adhesive (8) and consequent loss of bonding properties can be reversed by implementing the heat-reactivation step.

12. A device for the assembly of packets for tobacco products, comprising feed means by which a wrapping material (3) is advanced along a wrapping line (1) of a packaging machine, means (4) by which to apply a layer or a dab of cold-setting adhesive (8) to predetermined areas (8a, 8b) of the wrapping material (3), and folding means by which the wrapping material (3) is formed into a packet, characterized in that it further comprises heater means (15) serving to reactivate the cold-setting adhesive (8) applied to

the predetermined areas (8a, 8b), by exposure of the self-same areas to heat, at a predetermined reactivation temperature (t_r).

13. A device as in claim 12, comprising cooling means (28) located downstream of the heater means (15) along the feed direction followed by the wrapping material (3) and serving to cool at least the predetermined areas (8a, 8b) exposed previously to the action of the heater means (15).

14. A device as in claim 12, wherein the action of the heater means (15) is applied to all of the packets (2) assembled by the packaging machine when in operation.

15. A device as in claim 12, comprising processing means (16) able to measure a stoppage time (T) resulting from a break in operation of the packaging machine and connected on the output side to a control unit (17) such as will generate a signal to activate the heater means (15) in the event that the stoppage time (T) resulting from the break in operation of the packaging machine is within a given interval of time between a first predetermined critical time value (T1) and a second predetermined critical time value (T2), within which any degradation of the cold-setting adhesive (8) and consequent loss of bonding properties can be reversed by implementing the heat-reactivation step.

16. A device as in claim 12, further comprising means (14) by which to restrain the packets (2), positioned downstream of the folding means (5), wherein the cold-setting adhesive (8) is heat-reactivated by means (15) associated with the restraint means (14).

17. A device as in claim 16, wherein the restraint means (14) comprise an outfeed channel (9) delimited by the active branches (13) of two conveyor belts (10) offered in contact to the flank faces of the packets (2), and the cold-setting adhesive (8) is heat-reactivated by means (15) comprising heated plates (18) breasted with the reverse faces of the active branches (13).

18. A device as in claim 12, wherein the cold-setting adhesive (8) is heat-reactivated by means (15) positioned upstream of the folding means (5).

19. A device as in claim 18, wherein the cold-setting adhesive (8) is heat-reactivated by means (15) comprising at least one convector heater or at least one radiator.

20. A cigarette packer, comprising a device as in claim 12.

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