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(54) **A method for forming twist wrappers and the respective equipment**

Verfahren und Vorrichtung zum Herstellen von Wickeln mit verdrehten Enden

Procédé et dispositif pour former des enveloppes à extrémités tordues

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Description

[0001] The present invention relates to a method for forming twist wrappers and equipment for carrying out the method.

[0002] Wrappers definable as twist wrappers are usually used in the food industry, and particularly in the confectionery sector, for packaging products such as boiled sweets, comfits, pastilles, etc. Essentially, in the solutions in current use, a semi-finished wrapper is first formed comprising a hollow or tubular-shaped wrapper sheet (possibly in several layers) in which the product is inserted. After the insertion of the product, the semi-finished wrapper is twisted adjacent the or each open end which results in the formation of the respective twisted projecting end portion.

[0003] The prior art is very extensive as evidenced, for example, by the documents FR-A-1529212, GB-A-105541, GB-A-1365840, US-A-2243633, US-A-2744370, US-A-3131522, US-A-3899865, US-A-4352265, US-A-4768639, US-A-4866922, US-A-4918901 and US-A-5016421.

[0004] With a certain degree of simplification but keeping essentially to the facts, one can say that, in prior-art solutions, each twisted end is formed with the "body" of the semi-finished wrapper (that is, the part in which the product is located) held stationary while the end portion or portions projecting therefrom are acted upon by a twisting member, typically a rotary gripper. In essence, all these known solutions duplicate, by means of a machine, the action of an operator who forms the twist manually.

[0005] The use of this type of solution on an industrial scale runs into an obstacle when it is desired to operate at very high rates on huge quantities of the product because of the intrinsic complexity of the apparatus which in fact prevents certain speeds and production levels from being achieved.

[0006] Reference is made here in particular to document DE-A-25 52 600.

[0007] The object of the present invention is to provide a solution which overcomes the intrinsic difficulties linked with the use of prior-art solutions, particularly in relation to the following factors:

- complexity of the members which form the twists,
- formation of the semi-finished wrapper, and
- insertion of the product in the semi-finished wrapper and retention thereof during the formation of the twist or twists.

[0008] According to the present invention, this object is achieved by a method having the characteristics called for in the claims which follow.

[0009] A further subject of the invention is equipment for carrying out this method.

[0010] The invention will now be described, purely by way of non-limitative example, with reference to the ap-

pendent drawings comprising Figures 1 to 10 which illustrate schematically a typical sequence by which the method of the invention is carried out.

[0011] By way of introduction it should be noted that the representations provided in the appended drawings are deliberately simplified and aim primarily to show the essential characteristics of the method of the invention.

[0012] More particularly, the description which follows relates specifically to an element or module of equipment for forming a twist wrapper (in this specific case a double-twist wrapper) around one product at a time. Since the module may be reproduced on a large scale, for example in the form of a matrix structure (each including m rows of n modules of the type illustrated in the appended drawings), it is possible to form equipment which is able to act simultaneously on m by n products, where m x n is a very large number (even of the order of hundreds). It is thus possible to form equipment which is able to achieve productivity levels of the order of thousands (in some cases tens of thousands) of wrapped products every minute.

[0013] It should also be pointed out that the structure of the equipment shown in the appended drawings is deliberately simplified by the omission of several parts having structures and functions which are well known in this branch of the art and which are not, in any case, essential for an understanding of the invention. Again it must be pointed out that the example illustrated is, indeed, just that, since the same method can be carried out by equipment very different from that illustrated by way of example.

[0014] In the appended drawings reference 1 generally indicates equipment usable to package products (typically sweet products such as boiled sweets and pastilles) in a twist wrapper. One is dealing specifically with a double-twist wrapper of the type generally indicated P in Figure 10.

[0015] In a known solution, the wrapper in question is made from sheet material (of paper, laminated plastics, aluminium etc), possibly with several layers. The wrapper in question is first wrapped around the pre-made product (here shown in the form of a disc-shaped pastille K) so as to form a channel-shaped, semi-finished wrapper and then it is twisted adjacent its ends to form two twisted, projecting end portions indicated F.

[0016] The core of the equipment 1 is constituted by a support 2, for example of metal, having an opening or cavity 3 in which a gear wheel 4 is mounted for rotation (in this embodiment about a horizontal axis), the gear having a radial slit or notch 5. The notch 5 may be seen as corresponding to a sort of slot created in the body of the gear 4 so as to create a recess which extends from a central portion of the gear 4 to open into its periphery which is toothed (partially or completely). In the embodiment illustrated, the notch in question is generally straight which, although preferred, should not be understood as imperative.

[0017] The same is also true with regard to the periph-

eral teeth of the gear 4 which cooperate, according to criteria which will be more fully explained below, with a rack or toothing 6 illustrated here as generally beneath the support 2, the support 2 being able to move relative to the rack 6. As will be more fully explained below, the meshing of the gear 4 with the rack 6 is intended to make the translational movement of the support 2 along the rack 6 cause the gear 4 itself to rotate about its central axis. Although the illustration shows the solution which is currently preferred in terms of reliability and simplicity, the same practical result (rotation of the gear 4) could be achieved in a different manner, for example by a drive associated with the gear 4. Needless to say, in this case, the gear need not necessarily be toothed and, in general, the gear could be replaced by any body capable of achieving the rotation of the notch 5, it thus not being essential to make use of a gear as such.

[0018] Consequently, even though the description below will make reference to the gear 4 and, in particular, a gear 4 which cooperates with a rack 6, it is understood that this choice is in no way binding.

[0019] Reference 7 indicates (see in particular Figure 2) a sort of die intended to be superposed on the support 2 so as to locate a slot 8 for use in the formation of the semi-finished wrapper and in the insertion of the product K in the semi-finished wrapper over the cavity 3 in which the gear 4 is located.

[0020] From an observation of Figure 1, it will further be noted that the support 2 also has a further notch 9 in a position generally aligned with the slot 8 when the die 7 is applied to the support 2, this further notch being coextensive with the notch 5 in the gear 4 in the position of formation of the semi-finished wrapper and introduction of the product (in practice in the position illustrated in Figure 1). A similar notch, indicated 10 and only partly visible in Figure 1, is provided in the other wall of the support 2 which defines the cavity 3 and is also aligned with the notch 5 and the notch 9.

[0021] Figure 3 illustrates an assembly for supplying sheet material G, for forming the twist wrapper which it is desired to make, located above the die 7 and, specifically, above the slot 8 (shown in broken outline in Figure 3).

[0022] In the embodiment illustrated, the assembly in question includes winding and unwinding reels (not illustrated, the structure being widely known in general) which carry the strip of sheet material G so that it passes over two drive rollers or rods 11. In use, the rods or rollers 11 are brought close to the upper, flat face of the die 7 in correspondence with the slot 8. Thus a given quantity of sheet material, possibly perforated to define a piece T intended to form the wrapper for a respective product, faces the top of the slot 8.

[0023] Reference 12 indicates a punch assembly comprising:

- a guide element 13 intended to be lowered (by drive means known per sé and not illustrated) over the

piece of sheet material G located over the slot 8, and

- a punch 14 proper which can enter the slot 8 through a respective slot 15 formed in the guide element 13. The whole is as illustrated in greater detail in Figure 4.

[0024] From an observation of Figures 3 and 4, it will also be noted that the punch 14 is in turn traversed vertically (in the embodiment illustrated) by a further slot 16 constituting a channel or duct for the insertion of the product K to be packaged in the semi-finished wrapper formed in the support 2 and, more precisely, in the combination of notches 5, 9 and 10 illustrated in Figure 1.

[0025] In particular, Figure 5 shows the result achieved by the lowering of the assembly 12 within the complex constituted by the support 2 and the die 7.

[0026] More particularly, when the element 13 is lowered over the sheet material G facing the slot 8, the slot 15 is located exactly in line beneath the slot 8. The two slots in question usually have approximately corresponding dimensions, the slot 15 preferably being slightly larger and/or having a slight flair so as to provide a "lead-in" to the punch 14 when it is lowered.

[0027] As it is lowered through the slots 15 and 8, the punch 14 enters the notches 5, 9 and 10, carrying with it the piece T of sheet material taken from the strip G. All this results in the formation of a semi-finished wrapper S of generally channel shape as shown schematically in Figure 5.

[0028] The product K subsequently introduced (by known means) into the duct 16 falls vertically within the punch 14 so as to be deposited in the bottom loop of the semi-finished wrapper S in the notch 5 in the gear 4.

[0029] At this point, the sheet-supply assembly (comprising the elements 11 and the strip G of sheet material from which the portion T forming the semi-finished wrapper S has been removed), as well as the inserter assembly (comprising the elements 13 and 16) are moved away from the support 2.

[0030] Clearly this movement may be of relative type. In the currently preferred solution, the two assemblies in question are usually made in the form of vertically-movable assemblies which are able to descend to engage the support 2 and the die 7. Naturally, in a wholly equivalent solution, the complex formed by the support 2 and the die 7 (and rack 6 which - for reasons which will become clear below - must be held in a fixed position relative to the elements 2 and 7 initially) may be movable so as to allow its disengagement from the assemblies indicated above.

[0031] In each case, the desired result is as follows: the support 2 containing (within the cavity 3) the gear 4 with the notch 5 within which is the semi-finished wrapper S and the product K is accessible from the open side of the semi-finished wrapper once the die 7 has been removed from the support 2.

[0032] As will readily be understood, in the embodi-

ment illustrated, the die 7 itself serves both as a guide element for the sheet-supply assembly and the inserter assembly and as a stabilising element for cooperating with the support 2 during the formation of the semi-finished wrapper S.

[0033] Once the condition shown schematically in Figure 5 has been reached, a new supply assembly, generally indicated 17, is brought close to the support 2 so that it can cooperate with the semi-finished wrapper S. Specifically the assembly 17 is intended to cooperate with the end portions of the semi-finished wrapper S which project laterally (at both ends in the example illustrated which shows the formation of a double-twist wrapper) from the body of the semi-finished wrapper S containing the product K and, hence, from the outer faces of the walls of the support 2 defining the cavity 3.

[0034] The assembly 17 is composed essentially of a pair of retaining or gripping elements 18 shown here in the form of jaws. Once the assembly 17 has been lowered so as to bring the jaws 18 to the height of the projecting ends of the semi-finished wrapper S, the jaws themselves, here shown with the clamping zone oriented vertically, may be closed so as to grip the ends of the semi-finished wrapper S between them, these ends also extending vertically.

[0035] The gripper elements here shown in the form of the jaws 18 are intended to hold the ends of the semi-finished wrapper S during the formation of the wrapper twists.

[0036] From this it results that the gripping action must at the same time be firm and not too vigorous: on the one hand it must prevent the ends of the semi-finished wrapper S escaping the gripping action but it is also true that this same gripping action must not oppose the formation of the twists by the twisting of the semi-finished wrapper S about its longitudinal axis. In other words, the jaws 18 must be able to allow the sheet material constituting the end portions of the semi-finished wrapper S to slide between them to a certain extent during the formation of the twisted ends. The degree and intensity of the gripping action must thus be determined selectively and in dependence on specific applicational requirements, taking into account firstly parameters such as the dimensions of the wrapper (and hence of the twisted ends) and the characteristics of the sheet material constituting the wrapper itself (thickness, degree of deformability, maximum breaking stress, slip, etc).

[0037] Once the position illustrated in Figure 7 has been reached, with the jaws 18 gripping the ends of the semi-finished wrapper S between them, the complex constituted by the support 2 and the assembly 17 is moved translationally relative to the rack 6.

[0038] Usually this result is obtained with the support 2 and the assembly 17 held stationary, in a fixed relative position, and the rack 6 being slid longitudinally. It is, however, also possible to do this in the complementary manner, the rack 6 being kept stationary while the support 2 and associated assembly 17 are moved, or, again,

with both the rack 6 and the support 2 and the assembly 17 being moved.

[0039] Whatever solution is adopted, the result is the movement of the rack 6 relative to the support 2 and the consequent rotation of the gear 4 (the outer teeth of which mesh with the rack 6) about its axis within the housing cavity 3 in the support 2. The rotation imparted to the gear 4 results in a corresponding rotation of the notch 5 in which the central portion, or body, of the semi-finished wrapper S containing the product K is located while the ends of the semi-finished wrapper S are held stationary by the jaws 18 of the assembly 17 so as not to be able to rotate. The overall result is that the body of the semi-finished wrapper S rotates relative to the ends and consequently the two twisted end portions, or twists F shown in Figure 10 are formed.

[0040] The solution according to the invention is thus aimed in a different direction from the prior art solutions in which the twisting of the semi-finished wrapper S required to form the twist or twists F is achieved by the rotation of the end or ends of the semi-finished wrapper relative to the body of the semi-finished wrapper. On the contrary, in the solution of the invention, the or each end is held stationary (in the embodiment illustrated, by the jaws 18) while the body is rotated (in the example illustrated by the gear 4).

[0041] The invention thus enables the equipment used for the formation of the twists to be simplified considerably in that the gripper elements 18 need not to rotate which considerably simplifies the structure. On the contrary, it is the part which houses the body of the semi-finished wrapper that is rotated, this, in the example illustrated, being the same part in which the semi-finished wrapper has previously been formed and in which the product K has been inserted (preferably, as in the example illustrated, by being dropped) into the semi-finished wrapper itself.

[0042] These aspects also constitute a further simplification over the previously known solutions with regard to the formation of the semi-finished wrapper, the retention of the product within the semi-finished wrapper and the retention of the semi-finished wrapper, with the product within it, during the formation of the twist.

[0043] Above all, the solution of the invention enables the structure of the semi-finished wrapper to be simplified, with the use of a simple channel shape (see in particular Figures 5 and 6) without the need to close the semi-finished wrapper itself into a tube around the product K: this latter operation, in various prior art solutions, involves the use of further shaping and/or temporary retaining elements for shaping the semi-finished wrapper tube and/or holding the semi-finished wrapper closed during the formation of the twists.

[0044] Starting from the position illustrated in Figure 8, the assembly 17 is raised so as to remove it from the support 2 (again in this case, the same result could be achieved by the lowering of the support 2 and associated members relative to the assembly 17) with the jaws

18 kept closed so as to retain the wrapper P, now completely formed with the twists F, between them and to remove it from the notch 5 and hence from the support 2. At this point, the assembly 17 may be used for example to transfer the completed wrapper P to a further work-station (for example a machine for inserting it in a box or bag) where the completed wrappers are freed by the opening of the jaws 18 so as to release the twisted ends F.

[0045] Naturally the pick-up action shown in Figure 9 is here made possible by the fact that the notch 5 is again aligned (vertically in the embodiment illustrated) with the notches 9 and 10. Naturally this does not exclude the possibility of the completed wrapper being withdrawn to some extent even in the absence of such alignment.

[0046] In any case, the situation illustrated is not a limitation in that, in most cases, it corresponds to the need to rotate the gear 4 through 360° by means of the relative movement of the rack 6 and the support 2. Even if the material of the wrapper has a certain resilience so that it tends to return to its undeformed condition after the formation of the twists, this angle of rotation suffices, without any other means, to create twists which remain firmly closed.

Claims

1. A method for forming twist wrappers, including the steps of:

- forming a semi-finished wrapper (S) of sheet material (G) including a body portion which houses a pre-made product (K) in the wrapper and at least one end portion which projects from the body portion, the body portion being housed in a rotary body (4) having a notch-like recess (5) for the formation of the semi-finished wrapper (S), and
- producing relative twisting of the at least one end portion and the body portion so as to form at least one twist, the twisting being effected with the at least one end portion held stationary and the body portion being rotated,

characterized in that it includes the steps of:

- providing a support(2) having a cavity (3) in which the rotary body (4) is housed, the said rotary body (4) being rotatable about an axis of said support (2) and the said support (2) having at least one notch (9, 10) communicating with said cavity (3),
- aligning the notch-like recess (5) of the rotary body (4) with the at least one notch (9, 10) of the support (2), and
- introducing the sheet material (G) into the

notch-like recess (5) so as to form the semi-finished wrapper (S) with a generally channel shape and at least one end portion projecting from the notch-like recess (5).

2. A method according to Claim 1, **characterized in that** the body portion is rotated through an angle of substantially 360°

3. A method according to Claim 1 or Claim 2, **characterized in that** it includes the steps of:

- gripping (18) the at least one end portion of the semi-finished wrapper (S), and
- imparting a generally rotational movement to the body (4) and hence the notch-like recess (5) while holding the at least one gripped end portion of the semi-finished wrapper (S) substantially stationary.

4. Equipment for forming twist wrappers, comprising:

- a rotary body (4) which has a notch-like recess (5) extending radially,
- supply means (11) for supplying sheet material (G) for forming the wrapper,
- inserter means (12 to 16) for inserting the sheet material (G) into the notch-like recess (5) so as to form a semi-finished wrapper (S) having a generally channel shape with a body portion housed in the notch-like recess (5) and at least one end portion projecting from the notch-like recess (5),
- supply means (16) for inserting a product (K) to be wrapped in the body portion of the semi-finished wrapper (S),
- retaining means (18) for engaging the at least one end portion of the semi-finished wrapper (S) so as to retain it against rotational movement, and
- drive means (6) for selectively rotating the rotary body (4), and hence the notch (5), about the axis, with the consequent rotation of the body portion of the semi-finished wrapper (S) relative to the at least one end portion engaged by the retaining means (18) and the formation of a twist in the at least one end portion,

characterized in that the rotary body (4) is housed in a cavity (3) of a support (2), the said rotary body (4) being rotatable about an axis of said support (2) and the said support (2) having at least one notch (9, 10) which communicates with the cavity (3) and with which the notch-like recess (5) in the rotary body can be aligned in use to receive the sheet material (G) from the inserter means (12 to 16).

5. Equipment according to Claim 4, **characterized in that** the rotary body is constituted by a gear wheel (4) and the drive means comprise gear teeth (6) meshed with the teeth of the gear wheel. 5
6. Equipment according to Claim 5, **characterized in that** the notch-like recess is constituted by a radial notch (5) formed in the gear wheel (4). 5
7. Equipment according to any one of Claims 4 to 6, **characterized in that** it includes a die element (7) including a slot (8) with which the notch-like recess (5) can be aligned selectively and **in that** the inserter means (12 to 16) insert the sheet material (G) in the notch-like recess (5) through the slot (8). 10 15
8. Equipment according to any one of Claims 4 to 7, **characterized in that** the inserter means comprise a punch element (14) which can enter the notch-like recess (5) so as to thrust the sheet material (G) into the notch (5). 20
9. Equipment according to Claim 8, **characterized in that** the punch element (14) has a longitudinal hole (16) defining a duct for the introduction of the product (K) into the body portion of the semi-finished wrapper (S). 25
10. Equipment according to Claim 8 or Claim 9, **characterized in that** the punch element (14) carries an associated guide element (13) with a respective slot (15) forming an insertion- and guide- aperture for the punch element (14). 30
11. Equipment according to any one of Claims 4 to 10, **characterized in that** the retaining means comprise at least one gripper formation (18) which is movable relative to the rotary body (4) so as to grip at the least one end portion of the semi-finished wrapper (S). 35 40
12. Equipment according to Claim 11, **characterized in that** the retaining means comprise a pair of jaws (18) which are movable relative to the rotary body (4) so as to be locatable on opposite sides of the rotary body (4) itself so as to grip respective end portions of the semi-finished wrapper (S) projecting from opposite sides of the rotary body (4). 45 50

Patentansprüche

1. Verfahren zum Herstellen von Verdrellverpackungen, umfassend die Schritte: 55
 - Ausbilden einer Halbverpackung (S) aus Blattmaterial (G) mit einem Körperabschnitt, der ein zuvor hergestelltes Produkt (K) in der Verpack-

kung aufnimmt und mit wenigstens einem Endabschnitt, der von dem Körperabschnitt vorragt, wobei der Körperabschnitt in einem Rotationskörper (4), der eine kerbenähnliche Aussparung (5) für die Bildung der Halbverpackung (S) aufweist, aufgenommen ist,

- Erzeugen einer relativen Verdrellung des wenigstens einen Endabschnitts und des Körperabschnitts, um so wenigstens eine Verdrellung zu bilden, die mit stationärem Halten des wenigstens einen Endabschnitts und Rotieren des Körperabschnitts bewirkt wird,

dadurch gekennzeichnet, dass es die Schritte umfasst:

- Bereitstellen eines Trägers (2) mit einem Hohlraum (3), in dem der Rotationskörper (4) aufgenommen ist, der um eine Achse des Trägers (2) drehbar ist und wobei der Träger (2) wenigstens eine Kerbe (9, 10) aufweist, die mit dem Hohlraum (3) in Verbindung steht,
- Ausrichten der kerbenähnlichen Aussparung (5) des Rotationskörpers (4) zu der wenigstens einen Kerbe (9,10) des Trägers (2), und
- Einführen des Blattmaterials (G) in die kerbenähnliche Aussparung (5), um so die Halbverpackung (S) im wesentlichen mit einer Kanalform und mit wenigstens einem Endabschnitt, der von der kerbenähnlichen Aussparung (5) vorragt, auszubilden.

2. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** der Körperabschnitt um einen Winkel von im wesentlichen 360° gedreht wird.

3. Verfahren nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** es die Schritte umfasst:

- Ergreifen (18) des wenigstens einen Endabschnitts der Halbverpackung (S), und
- Erteilen einer allgemeinen Rotationsbewegung auf den Körper (4) und folglich auf die kerbenähnliche Aussparung (5), während der wenigstens eine gegriffene Endabschnitt der Halbverpackung (S) im wesentlichen stationär gehalten wird.

4. Vorrichtung zum Herstellen von Verdrellungsverpackungen, umfassend:

- einen Rotationskörper (4), der eine kerbenähnliche Aussparung (5) aufweist, die sich radial erstreckt,

- eine Zuführeinrichtung (11) zum Zuführen eines Blattmaterials (G) zum Bilden der Verpackung,
- eine Einführeinrichtung (12 bis 16) zum Einführen des Blattmaterials (G) in die kerbenähnliche Aussparung (5), um so eine Halbverpackung (S) zu bilden, das im wesentlichen eine Kanalförmigkeit mit einem Körperabschnitt, der in der kerbenähnlichen Aussparung (5) aufgenommen ist und wenigstens einem Endabschnitt, der von der kerbenähnlichen Aussparung (5) vorragt, aufweist, 5 10
- eine Zuführeinrichtung (16) zum Einführen des Produkts (K), das in dem Körperabschnitt der Halbverpackung (S) zu verpacken ist, 15
- eine Halteeinrichtung (18) zum Eingriff nehmen des wenigstens einen Endabschnitts der Halbverpackung (S), um es gegenüber einer Rotationsbewegung festzuhalten, und 20
- eine Antriebseinrichtung (6) zum selektiven Drehen des Rotationskörpers (4) und folglich der Aussparung (5) um die Achse mit der folgenden Drehung des Körperabschnitts der Halbverpackung (S) relativ zu dem wenigstens einen Endabschnitt, der mit der Halteeinrichtung (18) in Eingriff steht und zur Bildung einer Verdrehung an dem wenigstens einen Endabschnitt, 25 30

dadurch gekennzeichnet, dass der Rotationskörper (4) in einem Hohlraum (3) eines Trägers (2) aufgenommen ist, wobei der Rotationskörper (4) um eine Achse des Trägers (2) drehbar ist und der Träger (2) wenigstens eine Kerbe (9, 10) aufweist, die mit dem Hohlraum (3) in Verbindung steht und mit der die kerbenähnliche Aussparung (5) in dem Rotationskörper bei der Verwendung ausgerichtet werden kann, um das Blattmaterial (G) von der Einführeinrichtung (12 bis 16) aufzunehmen. 35 40

5. Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** der Rotationskörper durch ein Zahnrad (4) gebildet ist und die Antriebseinrichtung eine Zahnstange (6) aufweist, die mit den Zähnen des Zahnrads in Eingriff steht. 45 50
6. Vorrichtung nach Anspruch 5, **dadurch gekennzeichnet, dass** die kerbenähnliche Aussparung (5) durch eine radiale Kerbe (5), die in dem Zahnrad (4) ausgebildet ist, gebildet ist. 55
7. Vorrichtung nach einem der Ansprüche 4 bis 6, **dadurch gekennzeichnet, dass** sie ein Stempel- element (7) umfasst, das einen Schlitz (8) aufweist, zu

dem die kerbenähnliche Aussparung (5) selektiv ausgerichtet werden kann, und dadurch, dass die Einführeinrichtung (12 bis 16) das Blattmaterial (G) durch den Schlitz (8) in die kerbenähnliche Aussparung (5) einführt.

8. Vorrichtung nach einem der Ansprüche 4 bis 7, **dadurch gekennzeichnet, dass** die Einführeinrichtung ein Stanzelement (14) aufweist, das in die kerbenähnliche Aussparung (5) treten kann, um so das Blattmaterial (G) in die Kerbe (5) zu schieben.
9. Vorrichtung nach Anspruch 8, **dadurch gekennzeichnet, dass** das Stanzelement (14) ein Langloch (16) aufweist, das einen Kanal zum Einführen des Produkts (K) in den Körperabschnitt des der Halbverpackung (S) definiert.
10. Vorrichtung nach einem der Ansprüche 8 oder 9, **dadurch gekennzeichnet, dass** das Stanzelement (14) ein zugehöriges Führungselement (13) mit einem entsprechenden Schlitz (15), der eine Einfuhr- und Führungs-Öffnung für das Stanzelement (14) bildet, trägt.
11. Vorrichtung nach einem der Ansprüche 4 bis 10, **dadurch gekennzeichnet, dass** die Halteeinrichtung wenigstens einen Greifaufbau (18) umfasst, der relativ zu dem Rotationskörper (4) bewegbar ist, um den wenigstens einen Endabschnitt der Halbverpackung (S) zu greifen.
12. Vorrichtung nach Anspruch 11, **dadurch gekennzeichnet, dass** die Halteeinrichtung ein Paar Backen (18) aufweist, die relativ zu dem Rotationskörper (4) bewegbar sind, um auf entgegengesetzten Seiten des Rotationskörpers (4) selbst angeordnet werden zu können, um die entsprechenden Endabschnitte der Halbverpackung (S), die von den entgegengesetzten Seiten des Rotationskörpers (4) vorragen, zu greifen.

Revendications

1. Procédé de formation de papiers d'emballage torsadés, comprenant les étapes consistant à :
 - former un papier d'emballage semi-fini (S) dans un matériau de feuille (G) comprenant une partie de corps qui loge un produit préfabriqué (K) dans le papier d'emballage et au moins une partie d'extrémité qui dépasse de la partie de corps, la partie de corps étant logée dans un corps rotatif (4) ayant un évidement en forme d'encoche (5) pour la formation du papier d'emballage semi-fini (S), et
 - produire une torsion relative de l'au moins une

partie d'extrémité et de la partie de corps de façon à former au moins une torsion, la torsion étant effectuée avec l'au moins une partie d'extrémité maintenue fixe et la partie de corps qui est tournée,

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caractérisé en ce qu'il comprend les étapes consistant à :

- fournir un support (2) ayant une cavité (3) dans laquelle le corps rotatif (4) est logé, ledit corps rotatif (4) pouvant tourner autour d'un axe dudit support (2) et ledit support (2) ayant au moins une encoche (9, 10) communiquant avec ladite cavité (3), 10
- aligner l'évidement en forme d'encoche (5) du corps rotatif (4) avec l'au moins une encoche (9, 10) du support (2), et 15
- introduire le matériau de feuille (G) dans l'évidement en forme d'encoche (5) de façon à former le papier d'emballage semi-fini (S) avec une forme globalement en U et au moins une partie d'extrémité dépassant de l'évidement en forme d'encoche (5). 20

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2. Procédé selon la revendication 1, **caractérisé en ce que** la partie de corps est tournée selon un angle de sensiblement 360°.

3. Procédé selon la revendication 1 ou la revendication 2, **caractérisé en ce qu'il** comprend les étapes consistant à :

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- pincer (18) l'au moins une partie d'extrémité du papier d'emballage semi-fini (S), et 35
- communiquer un mouvement globalement rotatif au corps (4) et par conséquent à l'évidement en forme d'encoche (5) tout en maintenant l'au moins une partie d'extrémité pincée du papier d'emballage semi-fini (S) sensiblement fixe. 40

4. Dispositif pour former des papiers d'emballage torsadés, comprenant :

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- un corps rotatif (4) qui a un évidement en forme d'encoche (5) s'étendant radialement,
- un moyen d'alimentation (11) pour amener le matériau de feuille (G) pour former le papier d'emballage, 50
- des moyens d'insertion (12 à 16) pour insérer le matériau de feuille (G) dans l'évidement en forme d'encoche (5) de façon à former un papier d'emballage semi-fini (S) ayant une forme globalement en U avec une partie de corps logée dans l'évidement en forme d'encoche (5) et au moins une partie d'extrémité dépassant de l'évidement en forme d'encoche (5), 55

- un moyen d'alimentation (16) pour insérer un produit (K) à emballer dans la partie de corps du papier d'emballage semi-fini (S),
- des moyens de retenue (18) pour engager l'au moins une partie d'extrémité du papier d'emballage semi-fini (S) de façon à la retenir contre le mouvement rotatif, et
- un moyen d'entraînement (6) pour faire tourner sélectivement le corps rotatif (4), et par conséquent l'encoche (5), autour de l'axe, avec la rotation qui en résulte de la partie de corps du papier d'emballage semi-fini (S) par rapport à l'au moins une partie d'extrémité engagée par les moyens de retenue (18) et la formation d'une torsion dans l'au moins une partie d'extrémité,

caractérisé en ce que le corps rotatif (4) est logé dans une cavité (3) d'un support (2), ledit corps rotatif (4) pouvant tourner autour d'un axe dudit support (2) et ledit support (2) ayant au moins une encoche (9, 10) qui communique avec la cavité (3) et avec laquelle l'évidement en forme d'encoche (5) dans le corps rotatif peut être aligné pendant l'utilisation pour recevoir le matériau de feuille (G) des moyens d'insertion (12 à 16).

5. Dispositif selon la revendication 4, **caractérisé en ce que** le corps rotatif est constitué par une roue d'engrenage (4) et les moyens d'entraînement comprennent des dents d'engrenage (6) en prise avec les dents de la roue d'engrenage.

6. Dispositif selon la revendication 5, **caractérisé en ce que** l'évidement en forme d'encoche (5) est constitué par une encoche radiale (5) formée dans la roue d'engrenage (4).

7. Dispositif selon l'une quelconque des revendications 4 à 6, **caractérisé en ce qu'il** comprend un élément de matrice (7) comprenant une fente (8) avec laquelle l'évidement en forme d'encoche (5) peut être aligné sélectivement et **en ce que** les moyens d'insertion (12 à 16) insèrent le matériau de feuille (G) dans l'évidement en forme d'encoche (5) à travers la fente (8).

8. Dispositif selon l'une quelconque des revendications 4 à 7, **caractérisé en ce que** les moyens d'insertion comprennent un élément de perforation (14) qui peut entrer dans l'évidement en forme d'encoche (5) de façon à pousser le matériau de feuille (G) dans l'encoche (5).

9. Dispositif selon la revendication 8, **caractérisé en ce que** l'élément de perforation (14) a un trou longitudinal (16) définissant un conduit pour l'introduction du produit (K) dans la partie de corps du papier

d'emballage semi-fini (S).

10. Dispositif selon la revendication 8 ou la revendication 9, **caractérisé en ce que** l'élément de perforation (14) supporte un élément de guidage associé (13) avec une fente respective (15) formant une ouverture d'insertion et de guidage pour l'élément de perforation (14). 5
11. Dispositif selon l'une quelconque des revendications 4 à 10, **caractérisé en ce que** les moyens de retenue comprennent au moins une formation de pinces (18) qui est mobile par rapport au corps rotatif (4) de façon à pincer l'au moins une partie d'extrémité du papier d'emballage semi-fini (S). 10 15
12. Dispositif selon la revendication 11, **caractérisé en ce que** les moyens de retenue comprennent une paire de mâchoires (18) qui sont mobiles par rapport au corps rotatif (4) de façon à pouvoir être positionnées sur des côtés opposés du corps rotatif (4) lui-même de façon à pincer les parties d'extrémité respectives du papier d'emballage semi-fini (S) dépassant des côtés opposés du corps rotatif (4). 20 25

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FIG. 1

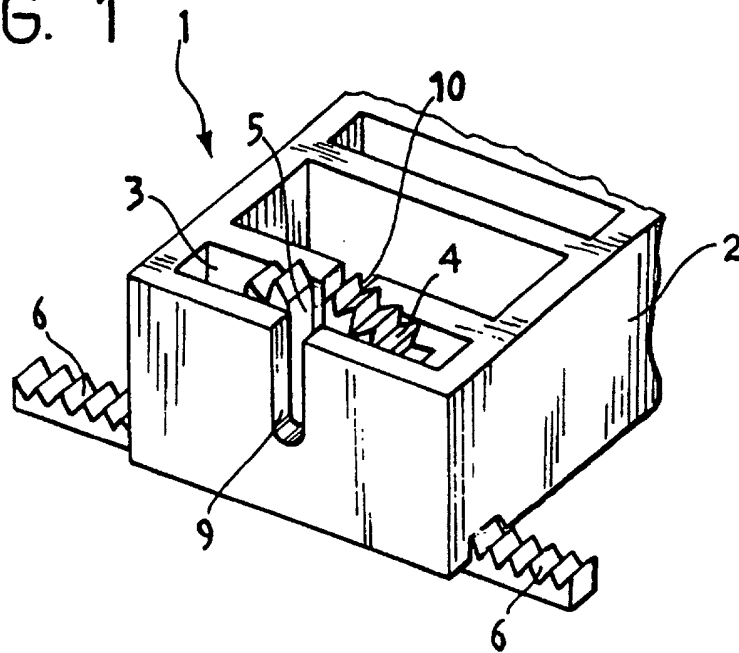


FIG. 2

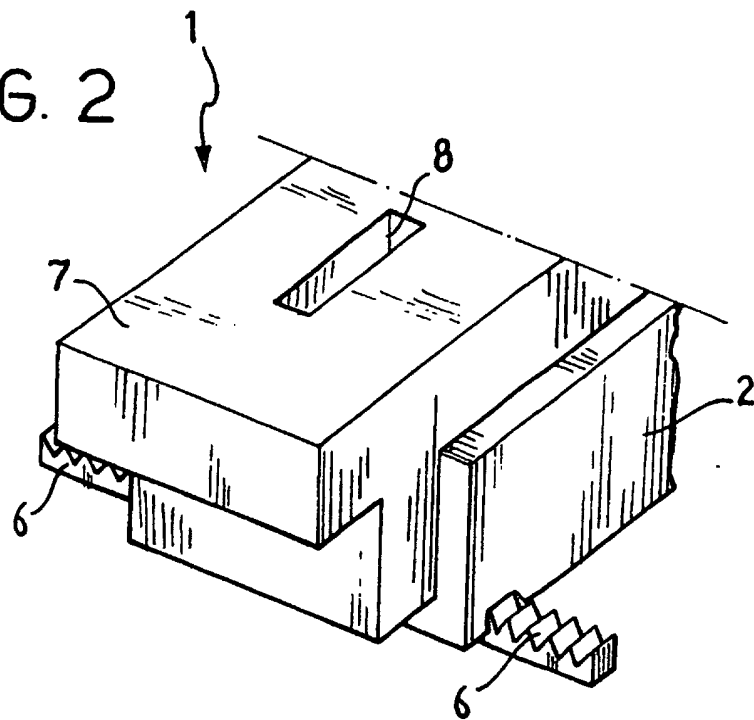


FIG. 3

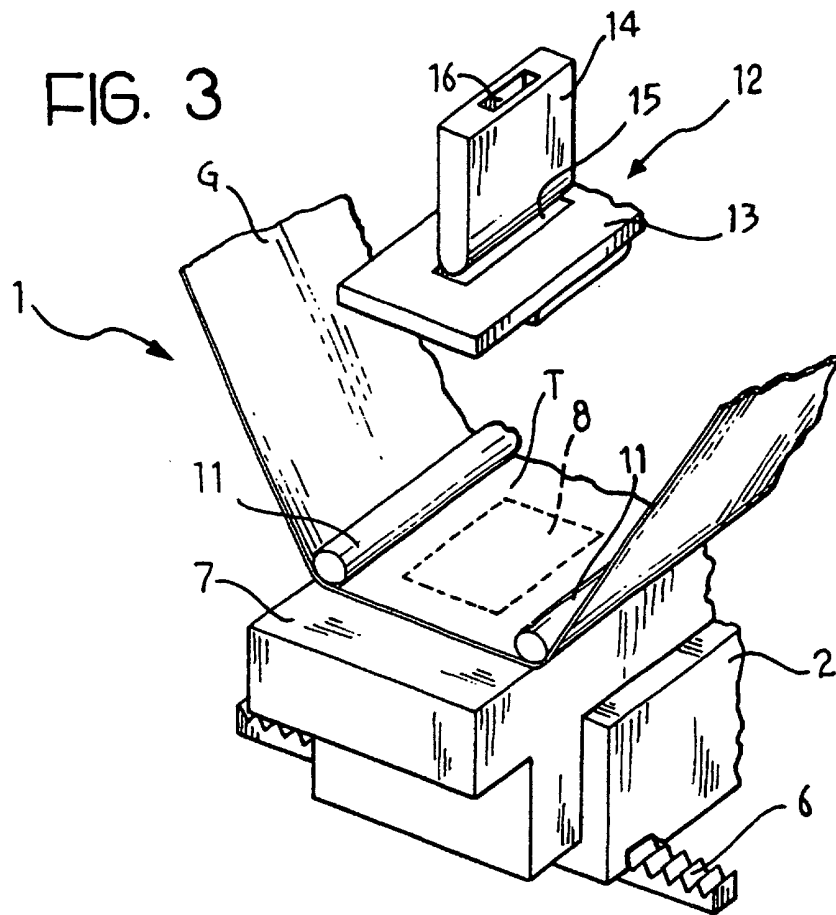


FIG. 4

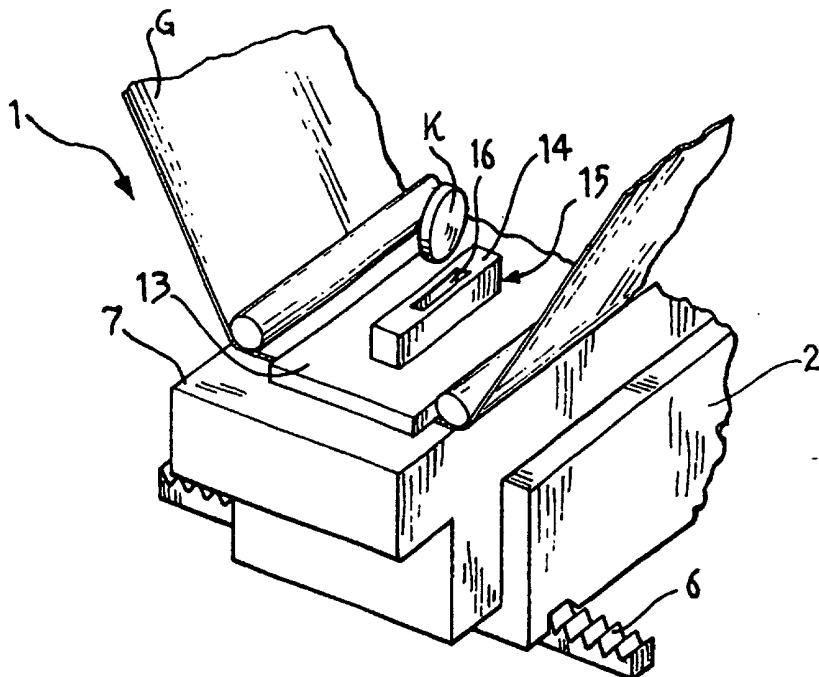


FIG. 5

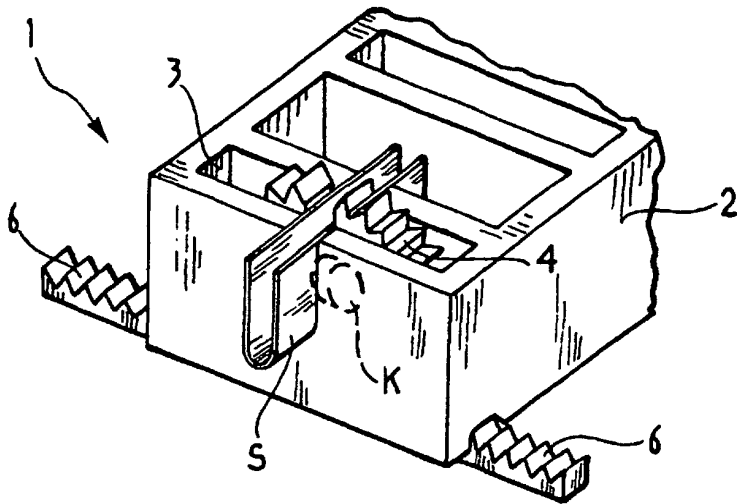


FIG. 6

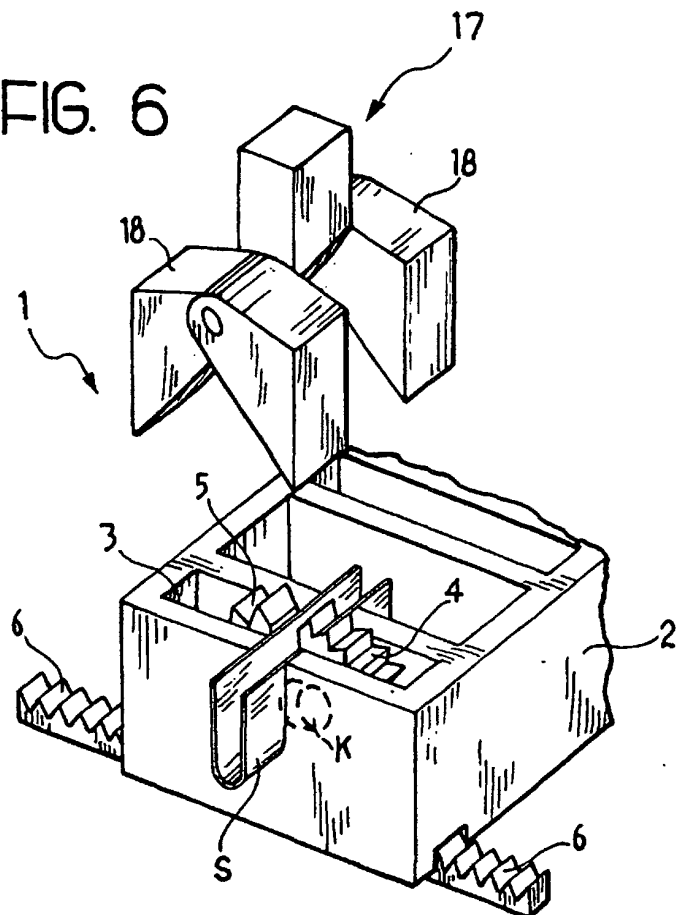


FIG. 7

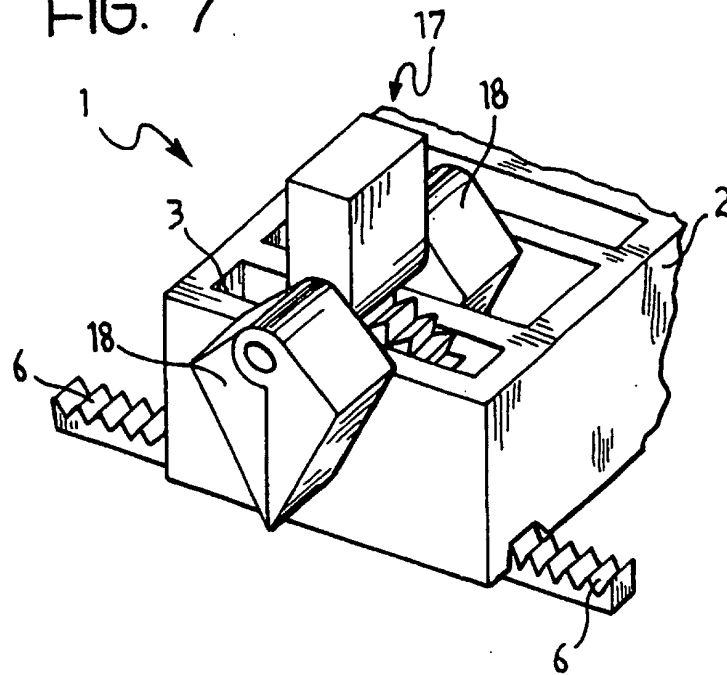


FIG. 8

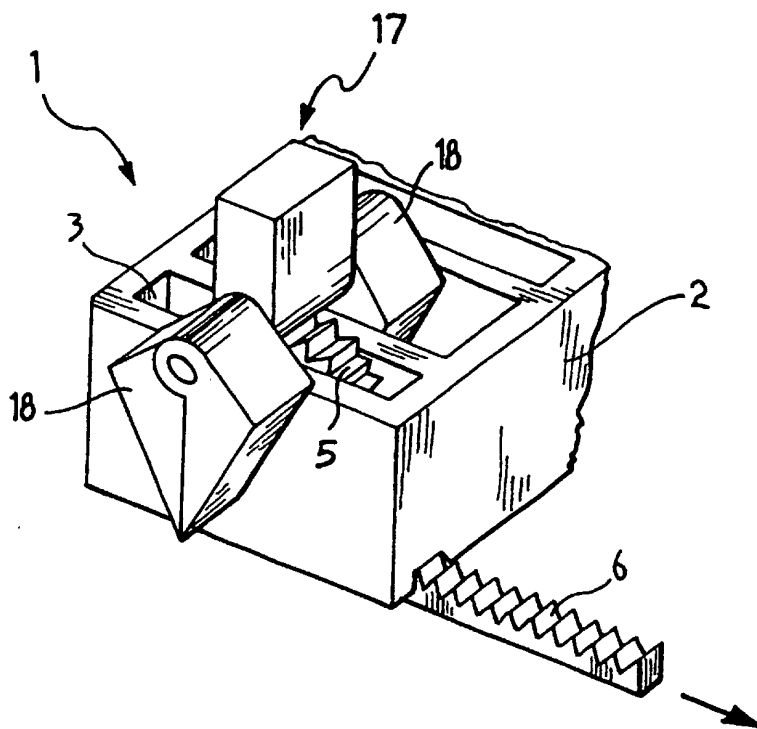


FIG. 9

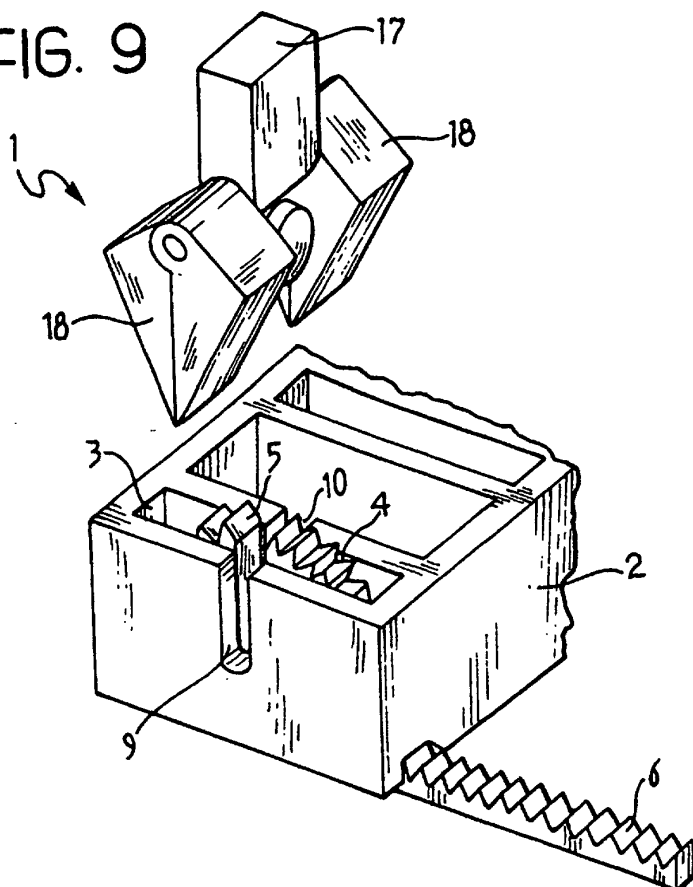


FIG. 10

