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(54) METHOD AND APPARATUS FOR TEARING OPEN OF PLASTIC BAGS

VERFAHEN UND VORRICHTUNG ZUM AUFREISSEN VON PLASTIKBEUTELN

PROCEDE ET APPAREIL DESTINES A L'OUVERTURE DE SAC PLASTIQUES PAR DECHIRURE

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Description

[0001] The present invention concerns a method for tearing open and emptying of plastic bags of the type used for collecting recycled paper in the form of newspapers, weeklies and advertising matter, that is paper items which is stacked and packed in a plastic bag, which is adapted to be closed by binding together handle means at each side of the filling opening of the bag, and without damaging the content of the bags.

[0002] In connection with refuse collection it has been increasingly common to perform some kind of source sorting of the collected refuse. Some cities have performed this task by providing each household with several small containers, namely a container for paper, final refuse and glass, respectively. Other cities have solved the problem by providing each household with one large container as respective types of refuse, such as compostible refuse, paper, final refuse and glass are filled into plastic bags with different colours and which are closed with a knot before the plastic bags are filled into the container. For example, green plastic bags are used for paper, that is newspapers, weeklies, cardboard and advertising matters black plastic bags for combustible final refuse and white plastic bags for glass and bottles.

[0003] At the recycling station, the plastic bags are emptied in a sorting facility where the sorting of the plastic bags is performed by means of a colour-based automatic or semi-automatic sorting manner so that by way of example green plastic bags with paper are sorted from the white and black plastic bags with glass and final refuse, respectively. Subsequently, the respective plastic bags are opened and emptied which traditionally has appeared to be a difficult and time consuming task.

[0004] JP-A-06 255 705, upon which the preamble of claim 3 is based, discloses a bag breaking device for resources dust wrapping materials, which is provided with a rotary where plural blade plates are radially protruded in a bag breaking chamber formed at the outlet of a hopper, a moveable plate which faces the rotary and is forced towards the rotary, and a conveyance conveyor formed below the bag breaking chamber. With this constitution, flat supporting plates are erected between the respective adjacent blade plates so as to be formed into a polygon, at the depth where most of the resources dust wrapping materials are collected and a part of them protrude. A bag breaking edge or the like is protruded at the outer periphery of the rotary.

[0005] The invention has the object of providing a method for tearing open and emptying plastic bags of the kind mentioned in the introduction, by way of example plastic bags with paper, and which in a simple way enables to empty the plastic bags in such a way that the paper content, by way of example newspapers, weeklies, and advertising matter, are not torn apart at the same time, that is without the subsequently needed sorting out of weeklies and coloured advertising matter being further impeded.

[0006] This is achieved by the method according to the invention as defined in claim 1, where a closed plastic bag with a content desired to be taken out is led down into a funnel-shaped container and is introduced between a rotating drum provided with rows of radially projecting knives with forward directed cutting edges and a springy, inclining wall part which is provided with stationary, projecting teeth approximately on level with the axis of the drum and between the knives of the drum, where the plastic bag is cut up successively by means of the knives and teeth, and where the content of the plastic bag also by means of the knives and the teeth, are successively emptied into a container or on a conveyor belt together with the torn open plastic bag, as an opposite fixed wall part of the receiving container is provided with a scraper plate with a number of edge recesses adapted to the length and shape of the knives.

[0007] Surprisingly it has appeared that a closed plastic bag filled with stacked paper items in the form of newspapers, weeklies or advertising matter by the indicated method may be torn open in such a way that the paper items without being torn apart, may successively be emptied into a container or on a conveyor belt, preferably together with the torn up plastic bag which after the tearing open is still in one piece, i.e. the plastic bag, either in immediate connection with the tearing up or subsequently, is easy to sort out manually or by machine. Apparently, the weight difference between the very light plastic bag and the relatively heavy paper items contributes to the successful, successive emptying of the paper items so that the tom up plastic bag leaving the tearing drum as the last may be led away by means of a rotating brush and/or sucking mouth piece.

[0008] In order not to impede the said subsequent sorting of the paper items, i.e. sorting out weeklies and advertising matter with colour printing, it is very important that the tearing up of the plastic bag and emptying of the paper items occurs as carefully as possible, and as mentioned it has surprisingly appeared not to be a problem by the described method.

[0009] For use in tearing open plastic bags of the type used for baked bread, that is white bread or rolls, the method according to the invention can be modified in such a way that one or more closed plastic bags with bread are tom open between the drum, which is provided with long, radial knives for the purpose, and the springy inclining wall which is provided with long, stationary teeth for the purpose. Hereby may be achieved an effective tearing open and emptying of plastic bags with baked bread collected from baker shops and supermarkets, and which is used for feeding animal husbandry, particularly pigs. The sorting out of the torn open plastic bags which still are in one piece may, as described above, occur manually or by machine.

[0010] The invention also concerns an apparatus for use in performing the method which is of the kind indicated in the preamble of claim 3 and is characterised in that the tearing up means for use in tearing open the

plastic bags are constituted by short knives provided with forward directed sharp cutting edges, that the stationary teeth are constituted by short pieces of round iron which are welded onto the springy wall part approximately on level with the horizontal axis of the drum, and that an opposite fixed wall part of the receiving container is provided with a scraper plate with a number of edge recesses adapted to the length and shape of the knives.

[0011] For use in performing the method according to claim 2, that is for tearing open plastic bags with baked bread, by way of example white bread and rolls, the apparatus according to the invention may comprise a mainly funnel-shaped receiving container, a horizontally rotating tearing up drum suspended therein and with radially projecting tearing up means, and stationary projecting teeth which are arranged to engage between the tearing up means and which are fastened on a springy wall part of the receiving container, and be suitably arranged so that the tearing up means for use in tearing open the plastic bags are constituted by long knives provided with forward directed sharp cutting edges, that the stationary teeth are constituted by pieces of flat bars which are welded onto the springy wall part approximately on level with the horizontal axis of the tearing up drum, and that an opposite fixed wall part of the receiving container is designed with a scraper plate with a number of edge recesses adapted to the length and shape of the knives.

[0012] In a simple way, for use in tearing open plastic bags with recycled paper, the apparatus according to the invention may be designed so that the knives have a radial extension of about 10 mm, that the largest width of the knives is about 8 mm, that the length of the knives in the peripheral direction is about 30 mm, that the pointed end part with the cutting edge of the knives has a length of about 10 mm, that the stationary teeth are constituted by round iron pieces with a length of about 20 mm and a diameter of about 12 mm. Suitably, the edge recesses of the scraper plate may have a depth of about 15 mm and a width of about 12 mm.

[0013] For use in the mentioned alternative tearing open of plastic bags for baked bread it may be advantageous that the knives have a radial dimension of about 50 mm, that the greatest width of the knives is about 12 mm, that the length of the knives in the peripheral direction is about 40 mm, that the pointed end part with the cutting edge of the knives has a length of about 12 mm, that the stationary teeth are constituted by flat bar pieces with a length of about 45 mm and a width of about 12 mm. And in this case, the edgewise recesses of the scraper plate may have a depth of about 60 mm and a width of about 15 mm.

[0014] The invention is explained more closely in the following in connection with the drawing, on which:

Fig. 1 shows a partial view of an embodiment of an apparatus according to the invention,

Fig. 2 shows a close-up view of a tearing drum for the apparatus of Fig. 1 according to the invention,

Fig. 3 a second partial view of some details by the apparatus of Fig. 1 according to the invention, and

Fig. 4 shows a plastic bag with newspapers and periodicals inserted between the tearing drum and a front spring biased wall plate with projecting retainer fingers.

[0015] The partial view depicted in Fig. 1 of an embodiment of an apparatus according to the invention shows an upwards open, funnel-shaped receptacle 2 of which one may be disposed at each side of a conveyor belt (not shown), comprising an ejector arm which is controlled by means of a colour sorting system that provides for bags containing recycled paper, by way of example folded newspapers, weeklies or advertising matter, are led down successively into the receptacle 2. A horizontal tearing drum 4 is mounted between opposite end walls 6 of the receptacle 2 which at the side situated in the running direction shown with arrow 7 of the tearing drum is provided with a spring biased inclining wall 8. At the opposite side, the receptacle 4 is closed downwards by means of a fixed scraper plate 10 which is designed with a number of edge recesses 12 towards the tearing drum 4, the number, shape and spacing of the recesses 12 being complementary to rows of tearing knives 14 projecting radially from the surface of the tearing drum 2. The scraper plate 10 has the purpose of scraping off material which otherwise would tend to be carried with the tearing drum 2.

[0016] In the shown embodiment, the tearing knives 14 of the tearing drum 2 consist of radial flat bar pieces projecting about 10 mm from the surface of the tearing drum 2 and having a total length in the peripheral direction of about 30 mm, of which a forward directed pointed end constituting about 10 mm ends in a sharp cutting edge 16. The spring biased inclining wall 8, which is spring biased for allowing escape of inadvertent hard, solid objects without blocking or damaging the tearing drum 2, is about on level with to axis of the tearing drum 2 provided with projecting stationary teeth 18 consisting of pieces of round iron which are welded to the inclining wall 8 between the tearing knives 14 and which have a length of about 20 mm and a diameter of about 12 mm.

[0017] The distance between the springy inclining wall-part 8 with the projecting stationary teeth 18 and the tearing drum 2 may advantageously be adjustable, something which may also be the case with the spring biased contact pressure of the inclining wall 8.

[0018] As shown in Fig. 3, the tearing drum 2 is driven by means of an electric motor 20 via a belt pulley 22 with a certain gear ratio, but alternatively the tearing drum 2 may be directly drivingly connected with an electric mo-

tor, the rotational speed of which being controlled by means of a frequency converter as the normal rotational speed of the tearing drum 2 is about 500 - 600 rpm.

[0019] The shown embodiment is intended for tearing open closed plastic bags 24 (Fig. 4) containing recycled paper, by way of example stacked newspapers, weeklies or advertising matter, which after emptying is to be sorted so that coloured paper, namely weeklies and advertising matter, is sorted from newspaper. In order to enable such subsequent sorting of the recycled paper, it is therefore important that the tearing open and emptying of the plastic bags occurs in such a way that the recycled paper maintains its structure, that is not tom too much apart. Furthermore, it is important that the plastic bag is not torn apart more than necessary for the emptying, that is as little as possible, the plastic bag is intended to remain in one piece which makes it reasonably easy to sort out the plastic bags. This may occur manually or by machine by means of brushes or suction mouthpieces, or possibly a combination thereof, as this sorting out is facilitated by the plastic bag, as the lighter component, leaves the tearing drum last, as seen in direction of rotation, that is after the heavier recycle paper has left the tearing drum.

[0020] As indicated, the method and the apparatus, respectively, according to the invention may relatively easily be modified for use in tearing open and emptying of other kinds of content, by way of example plastic bags with baked bread in the form of white bread or rolls. For this purpose, the tearing drum is only provided with longer knives, by way of example with a radial dimension of about 50 mm and a width of about 12 mm. In the peripheral direction, the knives may have a total length of about 40 mm as the pointed end with the cutting edge of the knives may have a length of about 12 mm.

[0021] The stationary teeth may correspondingly be constituted by flat bar pieces with length about 45 mm and width about 12 mm. The mentioned edgewise recesses of the stationary scraper plate at the opposite side of the tearing drum are also naturally to be adapted to the actual shape and mutual position of tearing knives.

[0022] Finally, it is to be mentioned that the method and the apparatus according to the invention have appeared to have almost universal fields of application. Thus it has appeared that by means of apparatuses according to the invention, it has been possible to tear open and take out very different items from plastic bags, such as sausages, meat slices, meat, chocolate, sweets, other confectionery together with cookies with exceeded last date of sale. After tearing open and unpacking sausages and slices of meat, this material may by way of example be used as a very appreciated contribution to the biomass at the production of biogas. Chocolate, sweets and other confectionery goods may by way of example be used as supplement for animal feed after unpacking according to the invention.

Claims

1. A method for tearing open and emptying of plastic bags of the type used for collecting recycled paper in the form of newspapers, weeklies and advertising matter, that is paper items which is stacked and packed in a plastic bag, which is adapted to be closed by binding together handle means at each side of the filling opening of the bag, and without damaging the content of the bags, where a closed plastic bag (24) with a content desired to be taken out is led down into a funnel-shaped container (2) and is introduced between a rotating drum (4) provided with rows of radially projecting knives (14) with forward directed cutting edges (16) and a springy, inclining wall part (8) which is provided with stationary, projecting teeth (18) approximately on level with the axis of the drum and between the knives of the drum, where the plastic bag (24) is cut up successively by means of the knives (14) and teeth (18), and where the content of the plastic bag also by means of the knives (14) and the teeth (18), are successively emptied into a container or on a conveyor belt together with the torn open plastic bag, as an opposite fixed wall part of the receiving container is provided with a scraper plate (10) with a number of edge recesses (12) adapted to the length and shape of the knives (14).

2. A method according to claim 1 and for tearing open and emptying of plastic bags containing baked bread, by way of example white bread or rolls, and without damaging the content of the bags, where one or more closed plastic bags with bread are torn open between the drum, which is provided with relatively long, radial knives for the purpose, and the springy inclining wall part which is provided with relatively long, stationary teeth for the purpose.

3. An apparatus for use in performing the method according to claim 1, that is for tearing open and emptying of plastic bags with recycled paper in the form of stacked newspapers, weeklies or advertising matter without damaging the content of the bags, comprising a mainly funnel-shaped receiving container (2), a horizontally rotating tearing up drum (4) suspended therein and with radially projecting tearing up means (14) and stationary, projecting teeth (18) which are arranged for engaging between the tearing up means (14) and which are fastened on a springy wall part (8) of the receiving container (2), the tearing up means for use in tearing open the plastic bags being constituted by short knives (14) provided with forward directed sharp cutting edges (16), the stationary teeth being constituted by short pieces of round iron (18) which are welded onto the springy wall part (8) approximately on level with the horizontal axis of the drum, and **characterised in**

that an opposite fixed wall part of the receiving container is provided with a scraper plate (10) with a number of edge recesses (12) adapted to the length and shape of the knives (14).

4. An apparatus for use in performing the method according to claim 2, that is for tearing open and emptying plastic bags containing baked bread, by way of example white bread and rolls, and comprising a mainly funnel-shaped receiving container (2), a horizontally rotating tearing up drum (4) suspended therein and with radially projecting tearing up means (14), and stationary projecting teeth (18) which are arranged to engage between the tearing up means (14) and which are fastened on a springy wall part (8) of the receiving container (2), **characterised in that** the tearing up means for use in tearing open the plastic bags are constituted by long, knives which are designed with sharp cutting edges in the direction of rotation, that the stationary teeth are constituted by relatively long pieces of flat bars which are welded onto the springy wall part approximately on level with the horizontal axis of the tearing up drum, and that an opposite fixed wall part of the receiving container is designed with a scraper plate with a number of edge recesses adapted to the length and shape of the knives.

5. An apparatus according to claim 3, **characterised in that** the knives (14) have a radial extension of about 10 mm, that the largest breadth of the knives is about 8 nun, that the length in the peripheral direction of the knives (14) is about 30 mm, that the pointed end part (16) with the cutting edge of the knives (14) has a length of about 10 mm, that the stationary teeth are constituted by round iron pieces (18) with a length of about 20 mm and a diameter of about 12 mm.

6. An apparatus according to claim 3, **characterised in that** the edgewise recesses (12) of the scraper plate (10) has a depth of about 15 mm and a width of about 12 mm.

7. An apparatus according to claim 4, **characterised in that** the knives have a radial dimension of about 50 mm, that the greatest width of the knives is about 12 mm, that the length of the knives is about 40 mm, that the pointed end part with the cutting edge of the knives has a length of about 12 mm, that the stationary teeth are constituted by flat bar pieces with a length of about 45 mm and a width of about 12 mm.

8. An apparatus according to claim 4, **characterised in that** the edgewise recesses (12) of the scraper plate have a depth of about 60 mm and a width of about 15 mm.

Patentansprüche

1. Verfahren zum Aufreißen und Entleeren von Plastikbeuteln des Typs, der zum Sammeln von recyceltem beziehungsweise wiederaufzubereitendem Papier in Form von Tageszeitungen, Wochenzeitschriften und Werbesachen benutzt wird, welche gestapelte und in einem Plastikbeutel verpackte Papierteile sind, der durch Zusammenbinden von auf jeder Seite der EinfiillöfFnung des Beutels angeordneten Handhabungselementen und ohne Beschädigen des Beutelinhalts verschließbar ist, wobei ein verschlossener Plastikbeutel (24) mit einem zum Herausnehmen bestimmten Inhalt nach unten in einen trichterförmigen Behälter (2) geleitet und zwischen eine sich drehende, Reihen von radial hervorstehenden Messern (14) mit vorwärts gerichteten Schneidkanten aufweisende Trommel (4) und einem federnden geneigten Wandabschnitt (8) eingeführt wird, welcher mit annähernd auf Höhe der Trommelachse und zwischen den Messern der Trommel angeordneten ortsfesten hervorstehenden Zähnen (18) ausgerüstet ist, wobei der Plastikbeutel (24) mittels der Messer (14) und Zähne (18) nacheinander zerschnitten wird, und wobei der Inhalt des Plastikbeutels ebenfalls mittels der Messer (14) und Zähne (18) nacheinander in einen Behälter oder auf ein Transportband mit dem aufgerissenen Plastikbeutel zusammen ausgeleert wird, da ein gegenüberliegend befestigter Wandabschnitt des Aufnahmebehälters eine Abstreifplatte (10) mit einer Anzahl von an die Länge und die Form der Messer (14) angepassten Kantenaussparungen (12) aufweist.

2. Verfahren nach Anspruch 1 und zum Aufreißen und Entleeren von Plastikbeuteln, die gebackenes Brot enthalten, beispielsweise Weißbrot oder Brötchen, und ohne Beschädigen des Inhalts der Beutel, wobei ein oder mehrere verschlossene Plastikbeutel mit Brot zwischen der für diesen Zweck mit relativ langen radialen Messern ausgerüsteten Trommel und dem für diesen Zweck mit relativ langen ortsfesten Zähnen ausgerüsteten federnden geneigten Wandbauteil aufgerissen werden.

3. Vorrichtung zur Durchführung des Verfahrens nach Anspruch 1 zum Aufreißen und Entleeren von Plastikbeuteln mit recyceltem beziehungsweise wiederaufzubereitendem Papier in Form von gestapelten Tageszeitungen, Wochenzeitschriften oder Werbesachen ohne Beschädigen des Inhalts, wobei die Vorrichtung Folgendes aufweist:

einen im Wesentlichen trichterförmigen Aufnahmebehälter (2),
eine darin aufgehängte horizontal drehbare Aufreißtrommel (4) mit radial hervorstehende

Aufreißeinrichtungen (14), und
ortsfeste hervorstehende Zähne (18), welche zum Eingreifen zwischen den Aufreißeinrichtungen (14) angeordnet und auf einem federnden Wandabschnitt des Aufnahmebehälters (2) befestigt sind,

wobei die Aufreißeinrichtungen für die Verwendung zum Aufreißen der Plastikbeutel aus kurzen Messern (14) mit vorwärts gerichteten scharfen Schneidkanten (16) gebildet sind, wobei die ortsfesten Zähne aus kurzen runden Eisenstücken (18) gebildet sind, die annähernd auf Höhe der horizontalen Achse der Trommel auf den federnden Wandabschnitt (8) aufgeschweißt sind, **dadurch gekennzeichnet, dass** ein gegenüberliegend befestigter Wandabschnitt des Aufnahmebehälters eine Abstreifplatte (10) mit einer Anzahl von an die Länge und die Form der Messer (14) angepassten Kantenaussparungen (12) aufweist.

4. Vorrichtung zur Durchführung des Verfahrens nach Anspruch 2 zum Aufreißen und Entleeren von Plastikbeuteln, die gebackenes Brot enthalten, beispielsweise Weißbrot oder Brötchen, und wobei die Vorrichtung Folgendes aufweist:

einen im Wesentlichen trichterförmigen Aufnahmebehälter (2),
eine darin aufgehängte horizontal drehbare Aufreißtrommel (4) mit radial hervorstehende Aufreißeinrichtungen (14), und
ortsfeste hervorstehende Zähne (18), und welche zum Eingreifen zwischen den Aufreißeinrichtungen (14) angeordnet und auf einem federnden Wandabschnitt des Aufnahmebehälters (2) befestigt sind, **dadurch gekennzeichnet, dass** die Aufreißeinrichtungen für die Verwendung zum Aufreißen der Plastikbeutel aus langen Messern gebildet sind, die mit in Drehrichtung ausgerichteten scharfen Schneidkanten (16), ausgebildet sind, dass die ortsfesten Zähne aus relativ langen Stükken von flachen Stangen gebildet sind, die annähernd auf Höhe der horizontalen Achse der Aufreißtrommel auf das federnde Wandbauteil (8) aufgeschweißt sind, und dass ein gegenüberliegend befestigter Wandabschnitt des Aufnahmebehälters mit einer Abstreifplatte ausgebildet ist, die eine Anzahl von an die Länge und die Form der Messer angepassten Kantenaussparungen aufweist.

5. Vorrichtung nach Anspruch 3, **dadurch gekennzeichnet, dass** die Messer (14) eine radiale Ausdehnung von ungefähr 10 mm aufweisen, dass die größte Breite der Messer ungefähr 8 mm beträgt, dass die Länge in der Umfangsrichtung der Messer (14) ungefähr 30 mm beträgt, dass das gespitzte beziehungsweise geschärfte Endteil (16) mit der Schneidkante der Messer (14) eine Länge von ungefähr 10 mm aufweist, dass die ortsfesten Zähne aus runden Eisenstücken (18) mit einer Länge von ungefähr 20 mm und einem Durchmesser von ungefähr 12 mm gebildet sind.

6. Vorrichtung nach Anspruch 3, **dadurch gekennzeichnet, dass** die seitlichen Aussparungen (12) der Abstreifplatte (10) eine Tiefe von ungefähr 15 mm und eine Breite von ungefähr 12 mm aufweisen.

7. Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** die Messer eine radiale Abmessung von ungefähr 50 mm aufweisen, dass die größte Breite der Messer ungefähr 12 mm beträgt, dass die Länge der Messer ungefähr 40 mm beträgt, dass das gespitzte beziehungsweise geschärfte Endteil mit der Schneidkante der Messer eine Länge von ungefähr 12 mm aufweist, dass die ortsfesten Zähne aus flachen Stangenstücken mit einer Länge von ungefähr 45 mm und einer Breite von ungefähr 12 mm gebildet sind.

8. Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** die seitlichen Aussparungen (12) der Abstreifplatte eine Tiefe von ungefähr 60 mm und eine Breite von ungefähr 15 mm aufweisen.

Revendications

1. Procédé pour ouvrir en les déchirant et pour vider des sacs en plastique du type utilisé pour recueillir du papier recyclé se présentant sous la forme de journaux, d'hebdomadaires et de supports publicitaires, c'est-à-dire des articles en papier qui sont empilés et emballés dans un sac en plastique, lequel est adapté pour être fermé en liant ensemble des moyens formant poignées prévus de part et d'autre de l'ouverture de remplissage du sac, sans endommager le contenu des sacs, dans lequel un sac en plastique (24) fermé ayant un contenu que l'on souhaite retirer est acheminé vers le bas jusque dans un bac en forme d'entonnoir (2) et est introduit entre un tambour rotatif (4), doté de rangées de couteaux (14) faisant saillie radialement et ayant des arêtes tranchantes (16) dirigées vers l'avant, et une partie élastique (8) formant paroi inclinée qui est dotée de dents saillantes stationnaires (18) situées à peu près au même niveau que celui de l'axe du tambour et entre les couteaux du tambour, dans lequel le sac en plastique (24) est coupé ensuite à l'aide des couteaux (14) et des dents (18), et dans lequel le contenu du sac en plastique est vidé ensuite, également à l'aide des couteaux (14) et des dents (18), dans un récipient ou sur une bande transporteuse avec le sac en plastique ouvert par

déchirement, et une partie opposée formant paroi fixe du bac de réception est dotée d'une plaque racleuse (10) comportant plusieurs encoches (12) situées au bord et adaptées à la longueur et à la forme des couteaux (14).

2. Procédé selon la revendication 1 pour ouvrir en les déchirant et pour vider des sacs en plastique contenant du pain cuit au four, à titre d'exemple, du pain blanc ou des petits pains, sans endommager le contenu des sacs, dans lequel un ou plusieurs sacs en plastique fermés contenant du pain sont ouverts en les déchirant entre le tambour, qui est doté de couteaux radiaux relativement longs prévus à cet effet, et la partie élastique formant paroi inclinée qui est dotée de dents stationnaires relativement longues prévues à cet effet.

3. Appareil destiné à être utilisé pour exécuter le procédé selon la revendication 1, c'est-à-dire pour ouvrir en les déchirant et pour vider des sacs en plastique contenant du papier recyclé se présentant sous la forme de journaux, d'hebdomadaires ou de supports publicitaires empilés sans endommager le contenu des sacs, comportant un bac de réception (2) essentiellement en forme d'entonnoir, un tambour de déchirement à rotation horizontale (4) suspendu dans celui-ci et comprenant des moyens de déchirement (14) faisant saillie radialement, et des dents saillantes stationnaires (18) qui sont agencées pour s'engager entre les moyens de déchirement (14) et qui sont fixées sur une partie élastique (8) formant paroi du bac de réception (2), les moyens de déchirement destinés à être utilisés pour ouvrir en les déchirant les sacs en plastique étant constitués de couteaux courts (14) dotés d'arêtes tranchantes (16) dirigées vers l'avant, les dents stationnaires étant constituées de courtes pièces de fer rond (18) qui sont soudées sur la partie élastique (8) formant paroi à peu près au même niveau que celui de l'axe du tambour, **caractérisé en ce qu'**une partie formant paroi fixe opposée du bac de réception est dotée d'une plaque racleuse (10) comportant plusieurs encoches (12) situées au bord adaptées à la longueur et à la forme des couteaux (14).

4. Appareil destiné à être utilisé pour exécuter le procédé selon la revendication 2, c'est-à-dire pour ouvrir en les déchirant et pour vider des sacs en plastique contenant du pain cuit au four, à titre d'exemple, du pain blanc et des petits pains, et comportant un bac de réception (2) essentiellement en forme d'entonnoir, un tambour de déchirement à rotation horizontale (4) suspendu dans celui-ci et comportant des moyens de déchirement (14) faisant saillie radialement, et des dents saillantes stationnaires (18) qui sont agencées pour s'engager entre les moyens de déchirement (14) et qui sont fixées sur une partie élastique (8) formant paroi du bac de réception (2), **caractérisé en ce que** les moyens de déchirement destinés à être utilisés pour ouvrir en les déchirant les sacs en plastique sont constitués de longs couteaux qui sont dotés d'arêtes tranchantes dans la direction de rotation, **en ce que** les dents stationnaires sont constituées de pièces relativement longues de barres plates qui sont soudées sur la partie élastique formant paroi à peu près au même niveau que celui de l'axe du tambour de déchirement, et **en ce qu'**une partie formant paroi fixe opposée du bac de réception est dotée d'une plaque racleuse comportant plusieurs encoches situées sur le bord et adaptées à la longueur et à la forme des couteaux.

5. Appareil selon la revendication 3, **caractérisé en ce que** les couteaux (14) présentent une extension radiale d'environ 10 mm, **en ce que** la largeur maximale des couteaux est d'environ 8 mm, **en ce que** la longueur dans la direction périphérique des couteaux (14) est d'environ 30 mm, **en ce que** la partie d'extrémité pointue (16) comprenant l'arête tranchante des couteaux (14) est longue d'environ 10 mm, et **en ce que** les dents stationnaires sont constituées de pièces de fer rond (18) d'une longueur d'environ 20 mm et d'un diamètre d'environ 12 mm.

6. Appareil selon la revendication 3, **caractérisé en ce que** les encoches (12) du bord de la plaque racleuse (10) sont profondes d'environ 15 mm et larges d'environ 12 mm.

7. Appareil selon la revendication 4, **caractérisé en ce que** les couteaux ont une dimension radiale d'environ 50 mm, **en ce que** la largeur maximale des couteaux est d'environ 12 mm, **en ce que** les couteaux sont longs d'environ 40 mm, **en ce que** la partie d'extrémité pointue comprenant l'arête tranchante des couteaux est longue d'environ 12 mm, et **en ce que** les dents stationnaires sont constituées de pièces de barre plate d'une longueur d'environ 45 mm et d'une largeur d'environ 12 mm.

8. Appareil selon la revendication 4, **caractérisé en ce que** les encoches (12) du bord de la plaque racleuse sont profondes d'environ 60 mm.

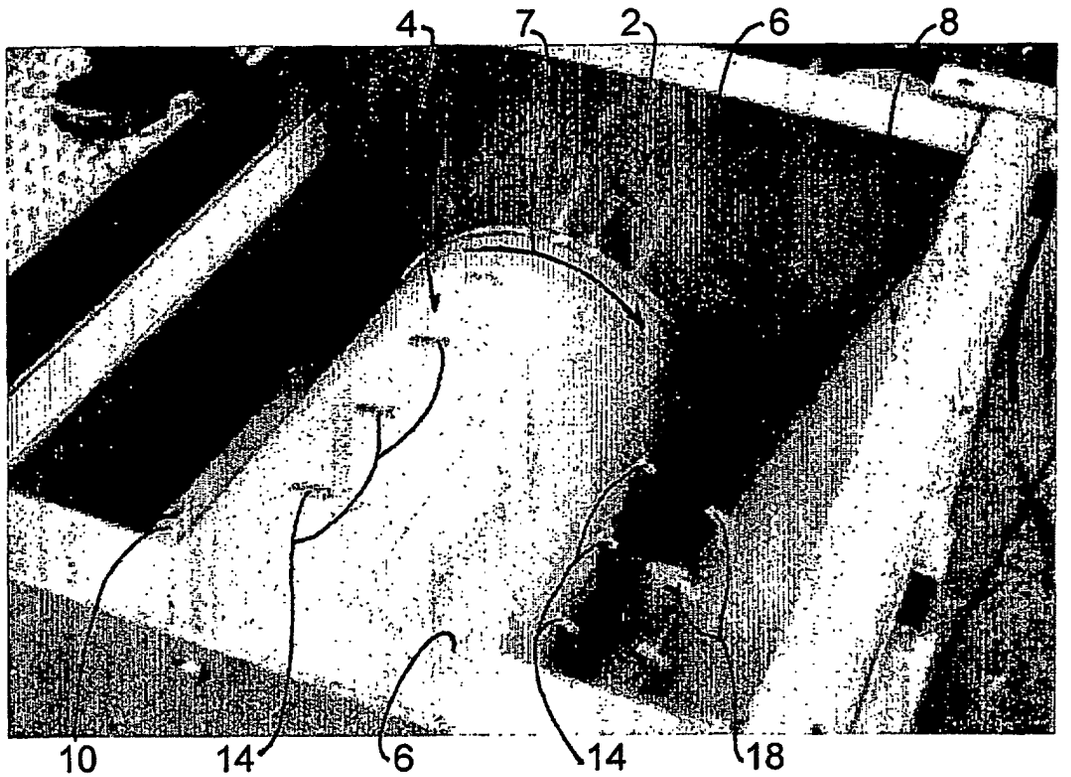

Fig. 1

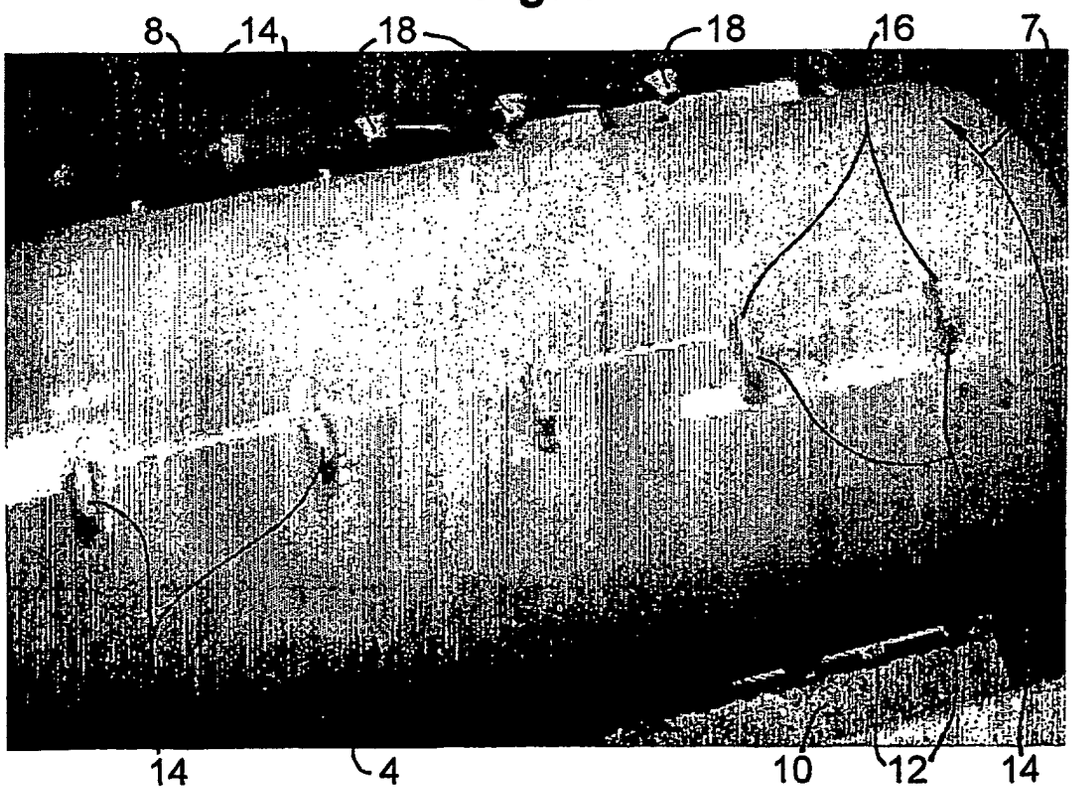

Fig. 2

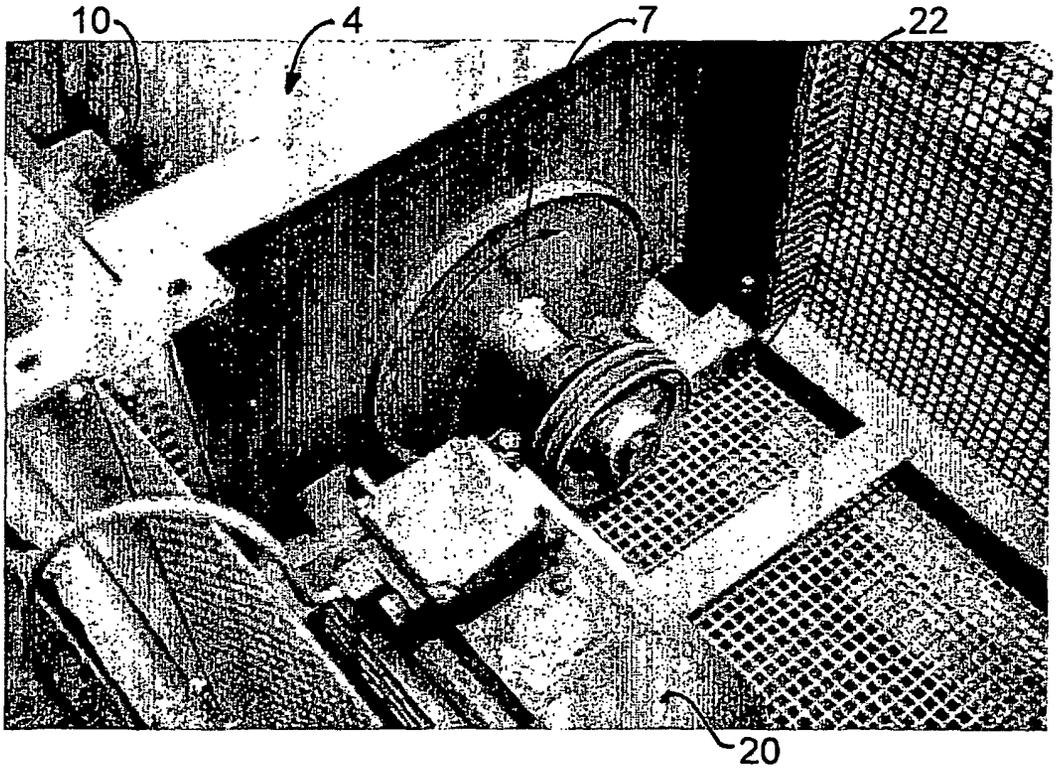

Fig. 3

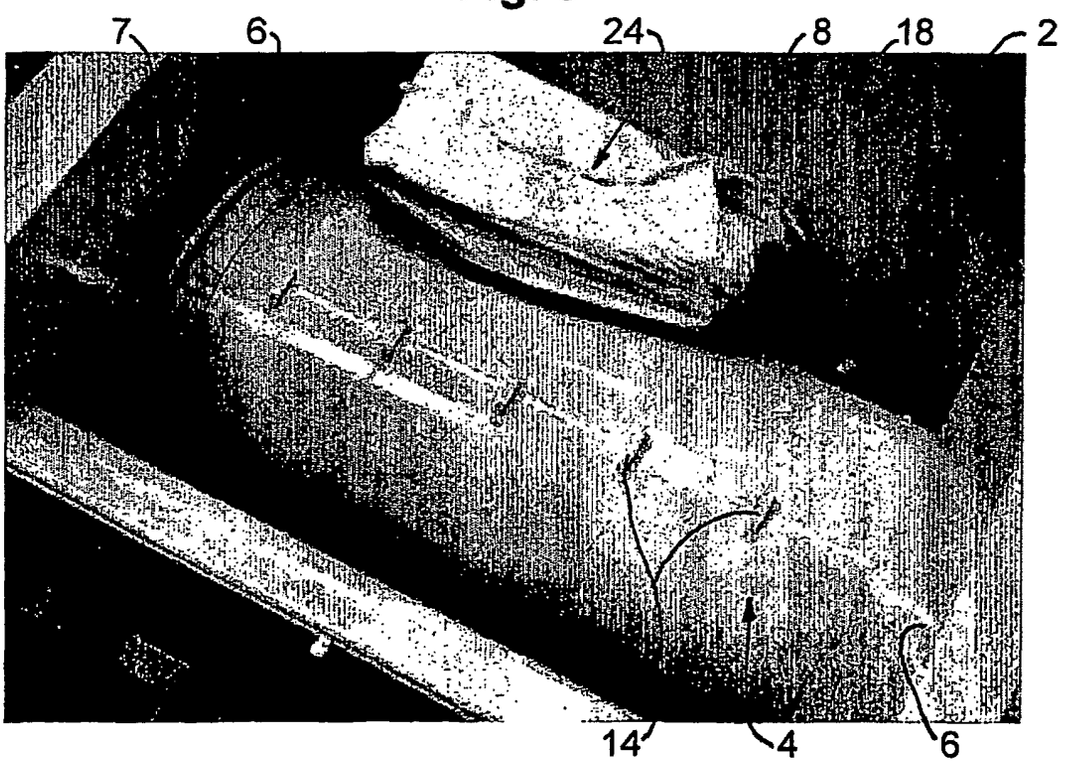

Fig. 4