



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
28.05.2014 Bulletin 2014/22

(51) Int Cl.:
B65D 85/04 ^(2006.01) **B65D 21/032** ^(2006.01)
B65D 81/22 ^(2006.01) **B65H 75/16** ^(2006.01)

(21) Application number: **14155505.2**

(22) Date of filing: **22.04.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR

(30) Priority: **28.04.2008 IT FI20080024 U**

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:
09738582.7 / 2 279 138

(71) Applicant: **Arnetoli Motor S.r.l.**
55066 Reggello (FI) (IT)

(72) Inventor: **Arnetoli, Fabrizio**
55066 Reggello (FI) (IT)

(74) Representative: **Mannucci, Michele et al**
Ufficio Tecnico Ing.A. Mannucci S.r.l.
Via della Scala 4
50123 Firenze (IT)

Remarks:

This application was filed on 18-02-2014 as a divisional application to the application mentioned under INID code 62.

(54) **Package for a cutting line for lawn mowers, brush cutters and the like**

(57) A package (51) of cutting line (F) made of polymeric material for brush cutters, lawn mowers, cutting devices for removing side shoots and the like, including: a laminar plastic material defining a housing shell for housing said cutting line (F), said housing shell having a substantially flat form; an aperture arranged in a nearly central position on a first face of said shell and provided with a removable cap (57), which can be applied in a reversible manner to said package (51) and which projects from said shell; a cutting line (F) in said housing; said shell is made by blow-molding; a cavity is provided on a second face of said shell, to allow more packages to be stacked.

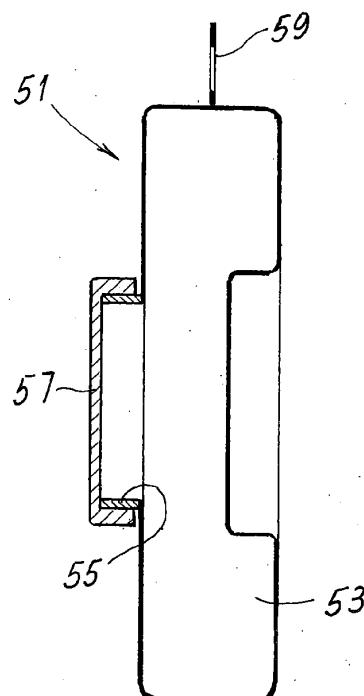


Fig. 6

Description

[0001] In the field of gardening equipment for use at both amateur and professional level, the use is well known of grass cutting heads for lawn mowers, brush cutters and the like, which use, as cutting elements, cutting lines in polymeric material. These lines project from a housing, which is carried in fast rotation around the drive shaft of the machine, and, due to centrifugal effect, they cut the vegetation. The cutting lines are subject to wear and breakage, and therefore they must be often replaced. For this purpose, packages of cutting lines in polymeric material are marketed, containing a several meters of line for its replacement in the cutting heads.

[0002] Usually, these lines are produced in polyamides with different chemical structures, all usually containing amide group CO-NH. Among the most important starting products for the production of these cutting lines there are the caprolactam, the adipic acid, and the hexamethylene diamine. Polyamides 6 and 6.6 are often associated with the mark "nylon". The features of the single polyamides do not differ much from each other; Immediately after the thermoplastic working, under dry condition, they are hard and less or more fragile materials. Following the absorption of water from the atmosphere or following water conditioning, they become more tough and abrasion resistant.

[0003] The packages used for marketing these materials are usually open and can last for a very long time before they finish, above all if the user does not use great quantities of line. This can entail, also based upon the environmental conditions of use, an excessive drying of the product and thus the loss of the characteristics of abrasion resistance and of toughness linked with the water absorption inside the polymeric structure.

[0004] The object of the invention is to provide a package, which allows a better conservation of the polymeric material forming the cutting line also after the first use thereof. This object is achieved with a package according to claim 1.

[0005] Further characteristics and embodiments of the package according to the invention are described in the appended dependant claims, and will be described in greater detail with reference to embodiments disclosed hereunder.

[0006] The drawing shows practical non limiting embodiments of the invention, and more in particular:

figure 1 shows a side view of a package according to one embodiment;

figure 2 shows a side view similar to that of figure 1 of a plurality of stacked packages;

figure 3 shows a plan view according to III-III in figure 1;

figure 4 shows a modified embodiment of the package not falling within the scope of the claims;

figure 5 shows a further embodiment in an axonometric view; and

figure 6 shows a section along VI-VI in figure 5.

[0007] With initial reference to figures 1 to 3, the package, indicated as a whole by reference number 1, can include a shell structure formed by a pair of semi-shells 1A, 1B made of thermoformed, for example vacuum molded, plastic material. Once coupled, the semi-shells 1A, 1B define a housing space, inside which the cutting line F is wound, as shown in figure 3. More in particular, the semi-shells 1A, 1B are welded along the edge 1C of the package and can have respective projections, which form a slot or eyelet 1D for hanging the package on a displayer.

[0008] Characteristically, one of the two semi-shells (in the example the semi-shell 1A) has an approximately round aperture in a substantially central position.

[0009] Around the central aperture of the upper semi-shell or semi-shell 1A, a ring or collar 3 is applied, for example a ring in plastic material welded, for example by means of ultrasounds, or glued, or in any way blocked to the laminar material forming the upper semi-shell 1A. The ring or collar 3 can be coupled in a reversible manner to a cover or cap 5. The coupling can be made through a thread, a bayonet grafting, a shape coupling joint or in any other manner. The coupling can be provided with a security seal which, once removed, allows to remove and to place the cap 5 again, so as to open and close the container or package 1. In this way, the user can open the package and extract the desired quantity of cutting line, cut it and close the package again by means of the cap 5. This safeguards the humidity conditions inside the package 1, conditions which can be made optimal in terms of saturation of the polyamide or other analogous polymer which forms the line F by adding of a small quantity of water inside the package.

[0010] Advantageously, in order to allow a simpler storage of the packages 1 in a small space, both for display and for transportation or storage, on the face of the package 1 opposite to that on which the cap 5 is applied to the ring 3, the semi-shell 1B has a cavity 7 having a shape substantially corresponding to, and preferably slightly wider, than the cap 5. In this way it is possible to stack (see figure 2) more packages 1 one on top of the other, in such a way that the cap of each package inserts in the cavity 7 of the overlying package.

[0011] In a modified embodiment (figure 4) the aperture for the extraction of the cutting line F is obtained in a tangential position or on the edge of the package, instead of on the front face of one of the semi-shells 1A, 1B forming the package, so that the line exits laterally and not centrally. In this case, according to an advantageous embodiment, the aperture can be surrounded by a bush 11 which forms the seat for a cap 13 which can be inserted in a reversible manner inside the bush 11 in order to close the package 1 with a sufficient sealing degree, analogously to what occurs with the cap 5 in the embodiment of figures 1 to 3. In this case again, the user can close the package 1 with the cap 13 every time he/she has

extracted the desired quantity of line F, to safeguard the desired high humidity conditions inside the package and therefore to maintain the characteristics of toughness and abrasion resistance of the line F. In order to facilitate unwinding of the line, this can be wound on a spool rotatingly housed inside the package.

[0012] Figures 5 and 6 show an embodiment of the package according to the invention. In this case, the package is produced by blow molding, in a manner similar, for example to the technique used for producing bottles of mineral water. The package indicated with the reference number 51 is formed by a single body 53 instead of by two welded semi-shells. The body 53 is produced by blow-molding in a mold, in which a tube made of polymeric material and coming from the extruder is inserted. The mold is closed so as to cut the tube of polymeric material along a substantially circular edge, and air is blown inside the tube of polymeric material still at the plastic status. The air is injected through a needle which perforates the polymeric material in correspondence of the portion which will be subsequently removed to form the aperture for the extraction of the line. With the molding operation the body 53 of the package is obtained, provided with a collar or ring 55 formed by molding along with the body 53. The ring or collar 55 is provided with a thread or other constraining mechanism, formed by molding, on which the cover 57 screws or engages. The membrane of plastic material which remains for closing the collar 55 is removed by means of an adequate cutting tool after cooling of the molded package. With the same molding it is possible to form - if required - a projection 59 forming a slot, an eyelet or a hook for hanging the package on a displayer.

[0013] The cover 57 can be engaged in a reversible manner with the collar or ring 55, instead of through a thread, by means of a bayonet grafting, through friction or in other suitable manner.

[0014] As in the case of the embodiment of figures 1 to 3, also in the case of blow-molded package a cavity can be provided on the face opposite to the cap or cover, to allow more packages to be stacked.

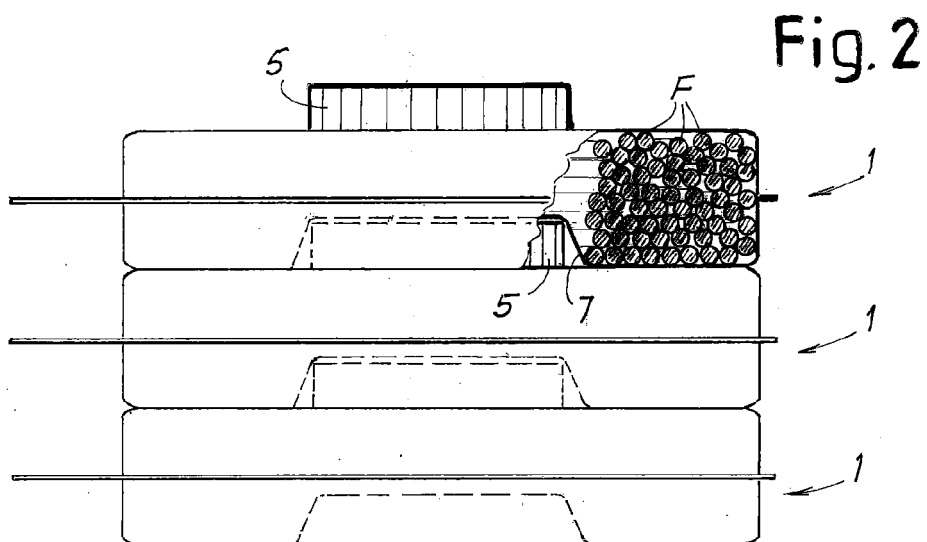
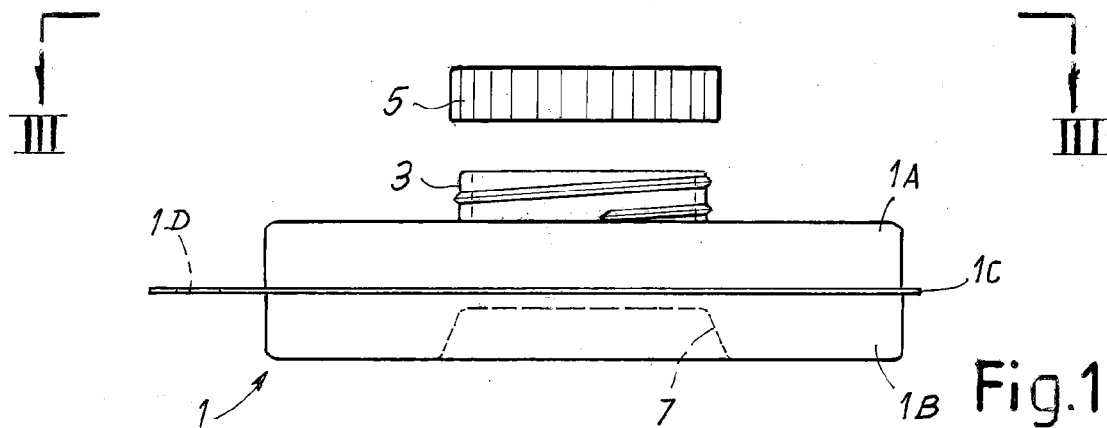
[0015] With the package object of the present invention it is possible for the user to maintain the line F always in the optimal conditions for its use, guaranteeing that it is always water-logged or in any way sufficiently impregnated with water. It is also possible that a certain quantity of water is loaded inside the package during the phase of production of the package itself, so that, even in case of particularly long periods of storage in dry environmental conditions and with an imperfect seal of the package 1, the line 1 remains always water-logged and therefore it remains always ready for use as the package is open.

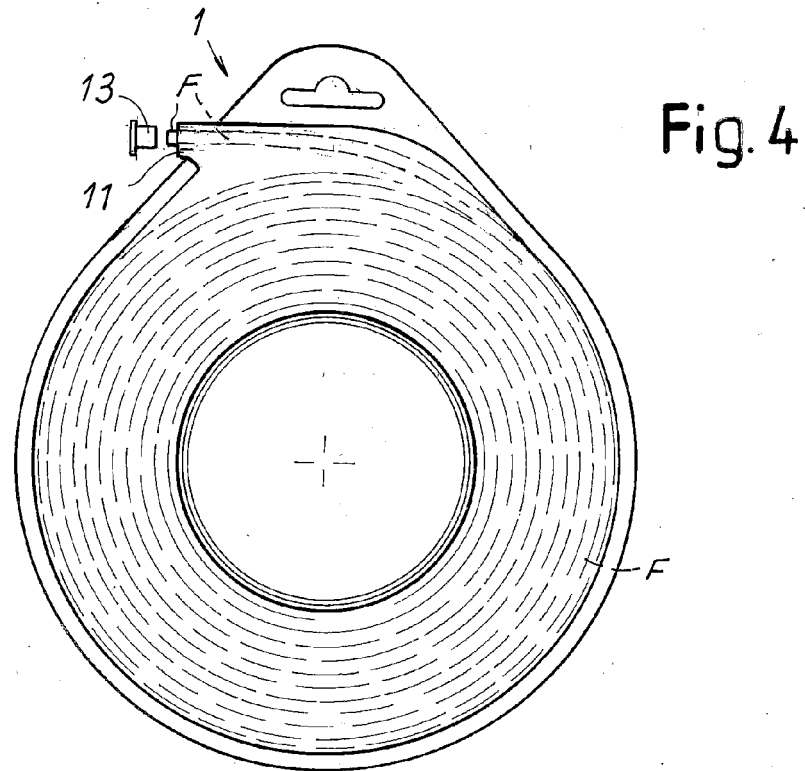
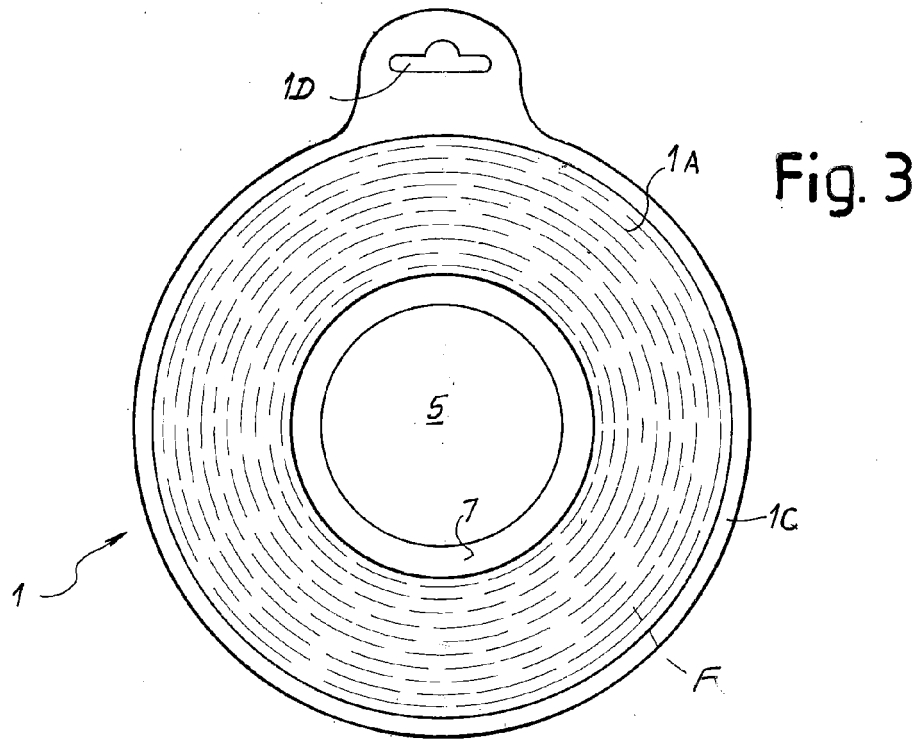
vices for removing side shoots and the like, including: a laminar plastic material defining a housing shell for housing said cutting line (F), said housing shell having a substantially flat form; an aperture arranged in a nearly central position on a first face of said shell and provided with a removable cap (57), which can be applied in a reversible manner to said package (51) and which projects from said shell; a cutting line (F) in said housing; **characterized in that** said shell is made by blowmolding; and that a cavity is provided on a second face of said shell, to allow more packages to be stacked.

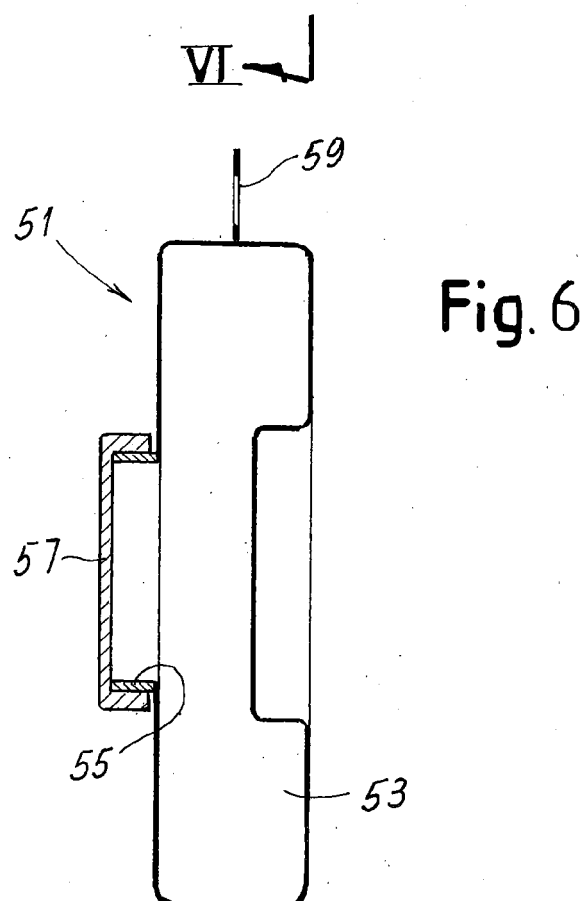
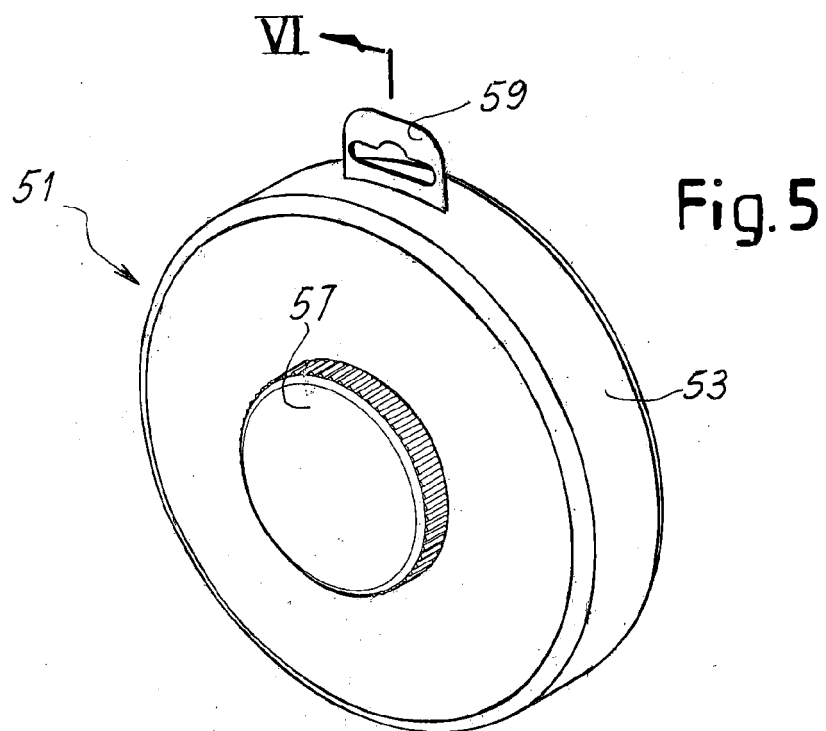
2. Package according to claim 1, wherein said cavity is arranged nearly in correspondence of said aperture, in such a way that a plurality of packages can be stacked by arranging the cap (57) of one package in correspondence of and inside the cavity of an adjacent package.
3. Package as claimed in claim 1 or 2, wherein said aperture is surrounded by a ring or collar, molded together with the shell, provided with means for reversible application of the removable cap.
4. Package as claimed in claim 1 or 2 or 3, containing water in order to maintain said cutting line under optimum humidity conditions.
5. Package as claimed in one or more of the previous claims, wherein said cutting line is made of a plastic material containing amide groups (CO-NH).
6. Package as claimed in one or more of the previous claims, wherein said cap is a screw or bayonet cap.
7. Package as claimed in one or more of the previous claims, wherein said aperture is surrounded by a ring of plastic material comprising coupling means for reversible coupling of said cap.

Claims

1. A package (51) of cutting line (F) made of polymeric material for brush cutters, lawn mowers, cutting de-









EUROPEAN SEARCH REPORT

Application Number
EP 14 15 5505

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	US 6 051 172 A (FOGLE JOHN R [US]) 18 April 2000 (2000-04-18) * column 6, line 35 - column 7, line 20 * * figures 4-8 *	1-7	INV. B65D85/04
Y	FR 1 227 794 A (HAGEN REINOLD M) 24 August 1960 (1960-08-24) * page 3 - page 7; figures 4,5,14 *	1-7	ADD. B65D21/032 B65D81/22 B65H75/16
Y	CH 330 424 A (LABOCENTRO AG [CH]) 15 June 1958 (1958-06-15) * page 1, line 36 - line 40 * * figures 1,2 *	1-7	
A	US 6 109 005 A (FOGLE JOHN R [US]) 29 August 2000 (2000-08-29) * abstract; figures 1-7 *	1-7	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 18 March 2014	Examiner Fitterer, Johann
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

1
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 14 15 5505

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

18-03-2014

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6051172 A	18-04-2000	NONE	

FR 1227794 A	24-08-1960	BE 580044 A	18-03-2014
		DE 1130151 B	24-05-1962
		FR 1227794 A	24-08-1960
		LU 37148 A	18-03-2014
		NL 122730 C	18-03-2014
		NL 239197 A	18-03-2014

CH 330424 A	15-06-1958	NONE	

US 6109005 A	29-08-2000	AT 256036 T	15-12-2003
		AU 742426 B2	03-01-2002
		AU 5190700 A	22-02-2001
		DE 60007040 D1	22-01-2004
		DE 60007040 T2	16-09-2004
		EP 1076007 A1	14-02-2001
		US 6109005 A	29-08-2000
