(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
16 March 2017 (16.03.2017)

WIPO | PCT

(10) International Publication Number
WO 2017/042425 A1

(51) International Patent Classification:
B26D 7/02 (2006.01) *B27L 7/00* (2006.01)

(21) International Application Number:
PCT/FI2016/000023

(22) International Filing Date:
7 September 2016 (07.09.2016)

(25) Filing Language: Finnish

(26) Publication Language: English

(30) Priority Data:
20150255 9 September 2015 (09.09.2015) FI

(72) Inventor; and
(71) Applicant : **SERLACHIUS, Jarl, Fredik** [FI/FI]; Post Box 78, 02701 Kauniainen (FI).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

(54) **Title**: WOOD CHOPPING BASE

(57) **Abstract**: The invention is a wood chopping base consisting of a spike base (3, 3A) fastened onto a chopping block (11) and of an additional level (2) mounted onto it for removing the chopped wood from it.

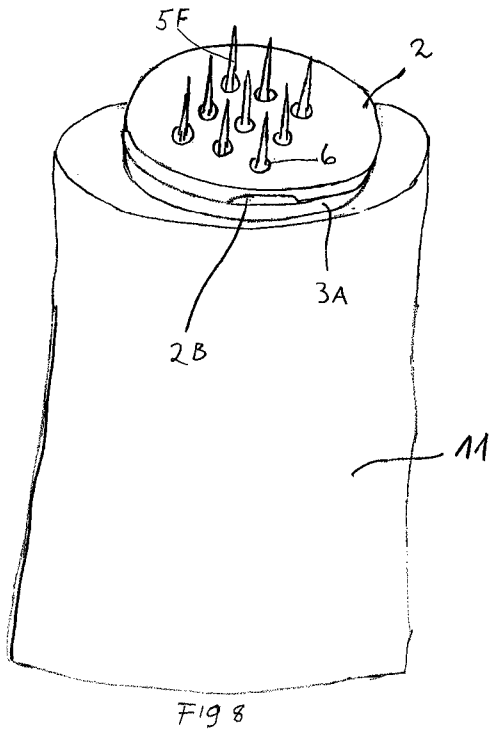


Fig 8

WO 2017/042425 A1

WOOD CHOPPING BASE

The invention consists of a wood chopping base that holds both the logs and the chopped wood pieces in an upward position on the chopping block and prevents the chopped wood from flowing to the side when being chopped.

There is no doubt the axe is among man's oldest tools. Throughout the ages, its design has hardly changed. The long, thin form of its handle is still the same and its flat splitting wedge-like form has also remained the same. When chopping wood, man still works the same way his ancient forefathers did. A chopping block, cut or sawn from a wider tree trunk, is placed as the base and the wood pieces or logs that are sawn to the correct measurements are placed one after another to stand on the chopping block and split with an axe. Although a simple task, at times it seems rather cumbersome as each time you have to be able to keep the wood being split in an upward position on the chopping block, and, each time a piece of wood is chopped, the woodchips fly around when hit with the axe. For this reason, it seems somewhat strange that man's naturally innovative mind has not found a solution for this problem. True, a radical solution for the problem has been figured out by totally giving up the axe and developing machine-operated wood processing tools that today are also used by many private households. But the axe firmly continues to remain a tool for daily physical activities in Finland, a country of forests. Although the splitting of logs with a machine is easier, nevertheless, wood chopping with an axe is seen as a natural part of Finland's landscape – and summer cottage – life. Although wood chopping is considered an outstanding form of daily physical activities, time and again, using home-invented means, man has tried to get rid of the two above-mentioned annoying issues related to wood chopping. The first one has to do with placing the log on the chopping block as the requirement is that, for it to remain in an upward position, the log has to have an even bottom surface. But, the log surface is often slanted or uneven and, in such a case, for trying to balance the log with an axe to handle it, you need a lot of exasperating time. True, there are people who keep the log in place with one hand and at the same time use the axe with the other hand. This way, they do not have this balance problem but it is easy for them to get rid of their other thumb. But, the majority of log choppers let go of the log and swing the axe with both hands.

The other annoying feature is when the axe splits the log and its both sides sling to different directions far away from the chopping block. If the splitting of logs is meaningful, the continuous picking of the log halves from the ground does not make sense. And it is hurtful for the back.

There have been home-invented and professional efforts to solve this problem. A tire may represent the best home-invented solution. The tire is placed on the chopping block to form a hole that keeps the logs in an upward position somehow. But, nevertheless, if the tire is not full of logs, due to the strong axe blow, the logs jump out of it. To place the logs to fit the size of the tire hole takes time and is more similar to working a jigsaw puzzle than to splitting logs.

A tall pipe in which the log is placed onto its base represents the professional solution. A weighed axe edge with the handle dropped into the pipe halves the log in the pipe due to the impact of a strong force. The idea works but it is cumbersome and too far removed from the popular traditional chopping of wood with an axe that the entire nation loves.

There are two ways to solve those problems. An element has to be generated that, not to encumber the work of the axe, both holds the log in an upward position and, during chopping, keeps the chopped wood pieces from flying around. This element can grip the log either on the side or at the bottom. Hence, the holding element may not obstruct the axe edge coming from above, and this sets certain requirements for the holding elements. The holding mechanism may not cross-directionally reach over the chopping block's chopping surface because it might hit the axe edge. This means that the mechanism must go directly upwards with respect to the surface of the chopping block. Then, we are left with two alternatives. The mechanism presses and holds onto the log either on the side or at the bottom. A mechanism with side fastening solution requires holders that are either curved inwards or outwards towards the centre of the chopping log surface, where the other ends of the holders are anchored onto the external side of the chopping block. The curvature is necessary as it makes sure that, without any obstruction, the wood being chopped can be fastened onto the tight so-called holder gaps and also removed from the holders. The method works, but it is technically relatively demanding to create a stable and

durable mechanism. And, the direction of the holders is partially cross directional with respect to the surface of the chopping block, and, in such a case, the axe edge may hit the holders with fatal consequences.

The invention presented here offers a safer and simpler solution that holds the wood pieces in place and together at the bottom characterised in that this so-called spike base is meant to be mounted on top of the chopping block's chopping surface, and a removable additional level made of durable and inflexible material is fastened on the spike base, and, thanks to the holes opened for the spikes in the additional level, this additional level places itself on the surface of the spike base, and the spike base's spikes protrude through those holes, and the purpose of the additional level is to remove the chopped wood from the spike base. It is possible to fasten the spikes directly onto the chopping block, but, in such a case, the bottom part of the spike must be a long, preferably screwable element with a broad sleeve or base mounted onto the chopping block, which sleeve prevents the spike from protruding into the chopping log as a result of the impact from an axe blow. The screwable element serves as an obstruction that prevents the spikes from being removed with the chopped wood from the chopping block. The spikes form the additional upper sleeve part. As the chopping block is not necessarily a base sturdy enough for the spikes, there is a more secure way to anchor the spikes onto a separate base so that they are firmly fastened onto it against any force impacted on them from the top, the bottom, and the sides. This means that the spikes must not be removed from the base as a result of any push force on the spikes and tensile force impacted by the chopping block on them, and they also must not bend by an impact from a side force. In practice, the mechanism has been solved so that a desired number of sharp-pointed and broad- or cross-based spikes are pushed all the way into a broadest possible spike base through the holes drilled into the base that is a few centimetres thick, and the spike bottom elements remain resting on the base surface or, alternatively are embedded somewhat deeper than the base surface. The broad base element prevents the spikes from protruding through the base. In other words, it is not possible for the

spikes to go upwards to be removed. Thereafter, the spikes are obstructed from escaping downwards by fastening another base, i.e., a spike bottom element, preferably with the same diameter and thickness as that of the spike base, on the back surface of the spike base, and that bottom element is fastened onto the spike base, preferably with bolts protruding through both of the bases. In order for the surface of the bottom base on the spike bottom elements not to become damaged by the push force on the spikes, it is recommended to embed a metal plate or some other piece made of hard material into the surface of the spike bottom element that is located against the spike bottom elements. This ensures that the spikes' bottom elements do not damage the surface resting against the bases.

What is described above makes sure that any movement downward and upward by the spikes is obstructed, but forces from the sides also affect the spikes and, as a result of their impact, the spikes tend to turn. To prevent this, the spikes must be made of a hard material, preferably of relatively thick tempered steel and the holes in the base, through which the spikes are threaded, must preferably be made stronger with broader edge sleeves through which the spikes are threaded. The broad-walled sleeves do not sink into the surrounding base wall as a result of bending which is what the spikes alone could do as a result of the turning force.

The reason for having the metal sleeves is that the actual base cannot be made of metal as that would damage the axe when it hits the metal base. As the base is made of nylon polyamide, its resistance against a blow suffices, but the material may wear as a result of the turning force and this is the reason it is recommendable to use metal sleeves.

When the spike base is made of a steel plate, into which the spikes made of tempered steel can be fastened with screws, it is possible not at all to need the sleeves, the holes to be drilled into the spike base's bottom element, and the bottom plate. In such a case, both the holes and the spikes in the metal plate are threaded which allows replacing any damaged spikes. When the spike base is made of metal, it being much thinner, ca. 0.5-1.0 cm thick, it

can be mounted as is onto the chopping block with screws or nails onto the metal plate through at least two holes drilled into its edge area.

But it is necessary to equip the metal spike base with a removable additional level placed on the metal plate, and this additional level has holes, ca. 0.5 cm wider than the spike bottom diameter, opened for the spikes, and the additional level is made of ca. 1.0 – 3.0 cm thick shock-proof nylon or inflexible, hard plastic or wood material with similar properties, and it is capable of receiving axe blows without damaging the axe edge and also capable of removing the chopped wood from the spikes. The outer edge of the additional level's bottom surface is made ca. 0.5 – 2.0 cm thinner at least in two locations ca. 3-8 cm inwards and ca. 10 cm along the edge, creating a gap or a hole between the spike base and the additional level, allowing an easy removal of the additional level and the chopped wood using, for instance, the flat axe edge.

The length of the spikes may vary between ca. 3 – 5 cm and the bottom thickness between ca. 0.5 – 1.0 cm, and the form of the spikes has to be conical and their surface ground to be smooth and slippery.If the spikes are not made conical and their surface is not made slippery, the removal of the chopped wood from the chopping block is really cumbersome, and this will quickly damage the spikes. To fasten the spikes onto the spike base successfully and efficiently, the form and profile of the part hidden under the additional level have to be such that they allow the use of a socket wrench or a monkey wrench for fastening the spikes onto the spike base with screws. This way, it is easy to remove a possibly corroded spike stuck on the spike base.

The diameter of the spike base may also vary, but its dimension should not extend beyond the diameter of a normal size chopping block that may vary between 20 and 40 cm. It is preferable for the spike base to be that much smaller than the chopping block that it leaves a place for an axe blow on the chopping block's own surface next to the spike base.

After having finished chopping the wood, to avoid any damage, it is advisable to place a protective cover on the spike base placed on the chopping block, as a non-protected spike-

filled surface is a hazard to the surroundings. A ca. 3 – 6 cm thick protective cover, made of nylon or some other, preferably weather-proof material that corresponds to the chopping base's external dimensions, with holes corresponding to the spike length drilled into its bottom surface for the spikes, and the spike base's spikes sink into them when the cover that is thicker than the spike length, is placed on the spike base. When the chopping continues, the cover is removed and the wood log is placed in an upward position on the spikes in the spike base and the chopping can begin.

The aforementioned wood chopping base also has another extremely useful function. Often, it is difficult to set fire on the wood pieces and, after the fire is lit, it often burns laboriously and lack energy. The reason for this may be that the wood pieces are not dry enough or that they are too large for the flames to start a fire in them. In such a case, the wood has to be chopped into sufficiently small pieces, or chips or deep cracks have to be made with a knife or axe on the surface of the wood pieces for the fire to start more easily. The wood chopping base serves as an excellent help in this activity. A piece of wood is placed on the spike base, and, thereafter, its top can be easily worked into effective kindling for starting a fire. As the top of the chopped wood is hit many times cautiously with an axe, its top soon turns into a bunch of chips or stick that stay together, are easy to ignite, and burn with efficient energy.

The following is a presentation of the invention with reference to the appended figures in which

Figure 1 shows the top of the wood chopping base cover.

Figure 2 shows the removable additional level.

Figure 3 shows the spike base from above.

Figure 4 shows the top surface of the bottom base.

Figure 5 shows the bottom surface of the wood chopping base cover.

Figure 6 shows the bottom surface of the spike base.

Figure 7 shows a side cross-section of the wood chopping base.

Figure 8 shows the wood chopping base without a cover mounted onto the chopping block (11).

Figure 9 shows a spike to be fastened into the chopping block.

Figure 10 shows the metal spike base with the spikes screwed into it.

Figure 11 shows the conical spike and the element staying hidden in the additional level, screwable with a socket wrench or a monkey wrench and, under it, there is the element to be screwed into the spike base.

Figure 1 shows the top of the wood chopping base cover (1).

Figure 2 shows the spike base's (3, 3A) removable additional level (2), and the additional level has holes (6) with a larger diameter than the diameter of the spikes (5, 5F, 5D) drilled into it for the spikes (5, 5F, 5D).

Figure 3 shows the spike base (3) from above, with 9 spikes (5) anchored into it. There are four holes (8) drilled into the spike base (3) for the bolts (7) to pass through for fastening the bottom base (4) onto the spike base (3). For mounting the spike base (3) onto the chopping block (11), there are two passable holes (9) drilled into the spike base (3) for the screws (10).

Figure 4 shows the bottom base (4) with 4 passable holes (8A) drilled into it for the bolts (7) to fasten it onto the spike base (3) and 2 holes (9A) to fasten it onto the chopping block (11).

Figure 5 shows the holes (5B) for the spikes (5) in the wood chopping base cover's (1) bottom surface.

Figure 6 presents the spike base's (3) bottom surface showing the spikes' (5) broad bases (5A) and the holes (8, 9) drilled for the bolts (7) and fastening screws (10).

Figure 7 present a cross-section of the wood chopping base from the side showing the spikes (5) hidden under the cover (1) and the screws (10) screwed into the chopping block (11) and the bolts (7) that hold the spike base (3) and the bottom base (4) together. The handle of the removable additional level (2) extends beyond the edge of the spike base (3).

Figure 8 shows the spike base (3A) fastened onto the chopping block (11) and ready for use. There is a thinning (2B) of the edge in the edge area of the additional level's (2) bottom surface, where the additional level (2) is removed from the spike base (3A).

Figure 9 shows the spike (5H) that is equipped with a broad base element (5C), a screw element (5E), and a spike element (5D) and directly fastened onto the chopping block (11).

Figure 10 shows the metal spike base (3A), in which the threaded spikes (5F) are screwed into the threaded holes (5G).

Figure 11 shows the conical spike (5F) in which the profile of the bottom part (5K), hidden in the additional level (2) fits a socket wrench or a monkey wrench and the bottom part (5M) of the spike (5F) screwed into the spike base (3A) is seen as a continuum of its bottom part (5K).

CLAIMS

1. A wood chopping base consisting of a flat base (3) equipped with metal spikes (5) CHARACTERISED IN THAT the spike base (3, 3A) is fastened onto the chopping block's (11) chopping surface and a removable additional level (2), made of durable and inflexible material, is fitted on top of the spike base (3, 3A), and, thanks to the holes (6) opened for the spike base's (3, 3A) spikes (5, 5F, 5D) in the additional level (2), the additional level (2) sets on the spike base, the spike base's (3, 3A) spikes (5, 5F, 5D) protrude through those holes (6), and the purpose of the additional level (2) is to remove the chopped wood pieces from the spike level (3, 3A).
2. A wood chopping base according to claim 1, C H A R A C T E R I S E D I N THAT, for the removal of the chopped wood, either the edge area of the an additional level's (2) bottom surface is made ca. 0.5 – 2.0 cm thinner at least in two locations for ca. 3 – 8 cm toward the centre and for the length of ca. 10 cm along the edge, forming a hole or a gap (2B) between the spike base (3, 3A) and the additional level (2), from where the additional level (2) with the chopped wood is removed from the spike base (3, 3A); or the outer edge of the additional level (2) is equipped with a handle (2A) extending beyond the edge area.
3. A wood chopping base according to claim 1, C H A R A C T E R I S E D I N THAT a desired number of spikes (5H) is fastened either with screws or nails onto the chopping block's (11) chopping surface, and the spikes' (5H) broadened bottom base (5C) divides the spike (5H) into the spike part (5D) on top of the spike's bottom base (5C) and the screw part (5E) below the bottom base to be fastened into the chopping block, and a removable additional cover (2) is placed on top of the spikes (5H).
4. A wood chopping base according to claims 1 and 2, C H A R A C T E R I S E D I N THAT, to make sure that the spikes (5) do not come loose from the spike base (3), a bottom base element (4) with the same diameter as that of the spike base (3) is fastened onto the bottom surface of the spike base (3) that is made of nylon or similar material.

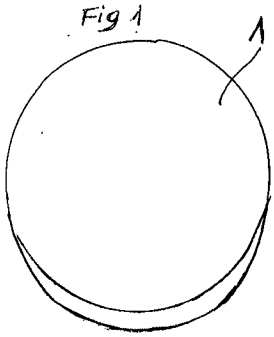
5. A wood chopping base according to claims 1 and 2, C H A R A C T E R I S E D I N THAT the spike base (3A) is preferably a round ca. 0.5 – 1.0 cm thick metal plate, and it has threaded (5M) spikes (5F) made of tempered steel fastened into the threaded holes (5G) in the metal plate, and the number of the spikes (5F) may vary between ca. 9 and 20 each, and the space between them may vary between 3 and 5 cm and their height may vary between 3 and 5 cm and the portion (5K) covered by the spikes' (5F) additional level (2) must correspond to a socket wrench's profile or be equipped with two flat surfaces on the opposite sides, and so that it will be easy to remove the spikes (5F) from, and fasten them onto, the metal plate with a socket wrench or a monkey wrench.

6. A wood chopping base according to claims 1, 2, 3, 4, and 5, C H A R A C T E R I S E D I N THAT the surface of the part above the additional level (2) of the spikes (5, 5F, 5D) has to be made of metal and that metal surface has to be ground to be absolutely smooth, slippery, and conical (5F).

7. A wood chopping base meeting all the requirements of the aforementioned claims meeting, C H A R A C T E R I S E D I N THAT the wood chopping base is equipped with a cover (1) whose diameter is the same as that of the spike base (3, 3A) and it is thicker than the length of the spikes (5, 5F, 5D), and the cover has holes (5B) that have the same thickness than the spikes (5, 5F, 5D) drilled into it for the spikes (5, 5F, 5D) to protrude into when the cover (1) is put in place on them.

1/4

Fig 1



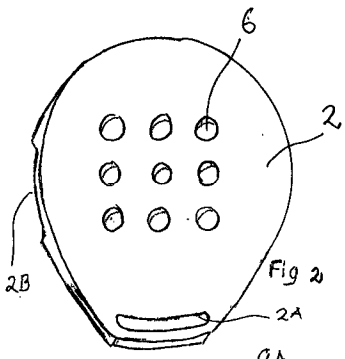


Fig 2

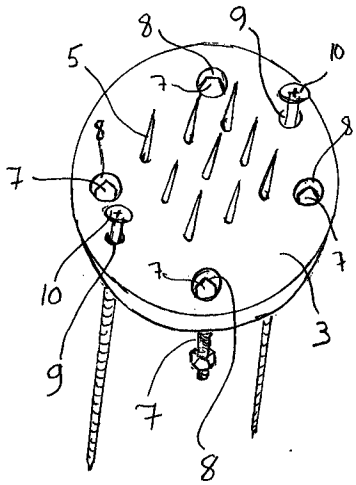


Fig 3

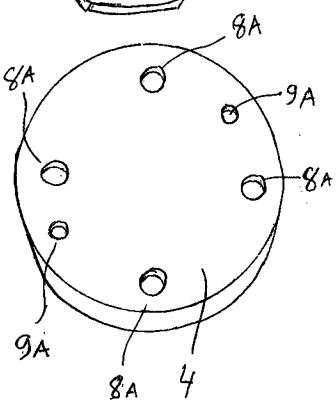


Fig 4

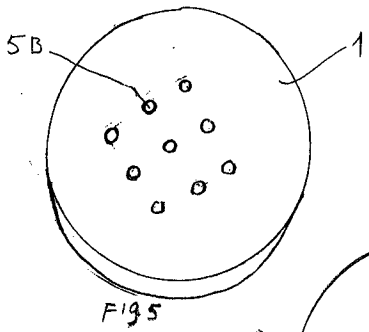


Fig 5

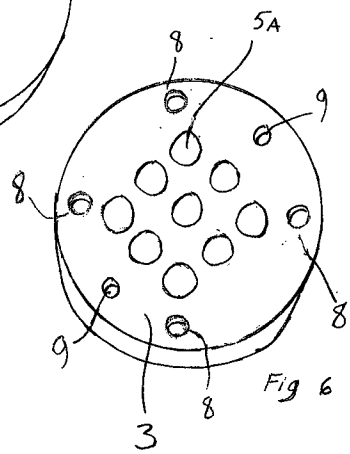


Fig 6

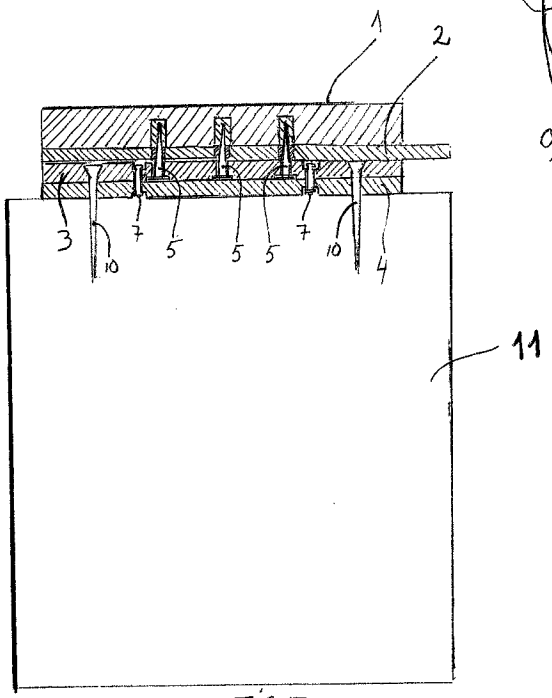


Fig 7

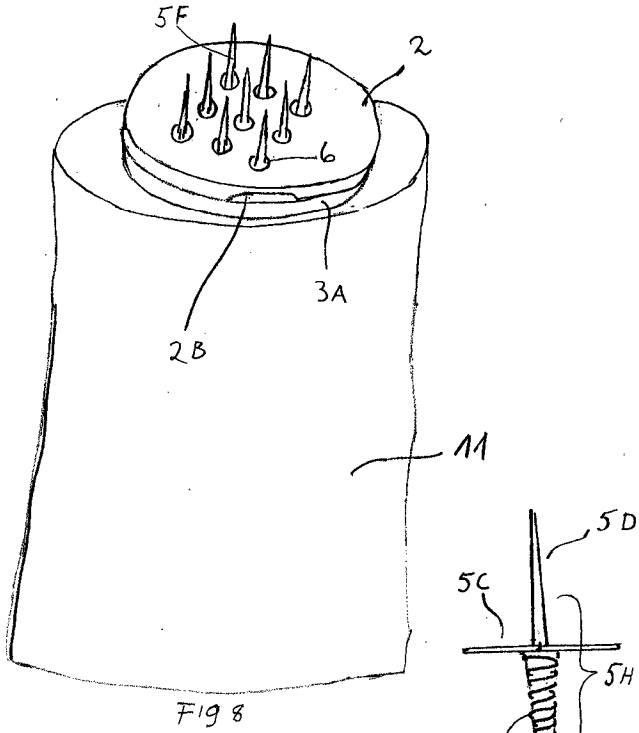


Fig 8

Fig 9

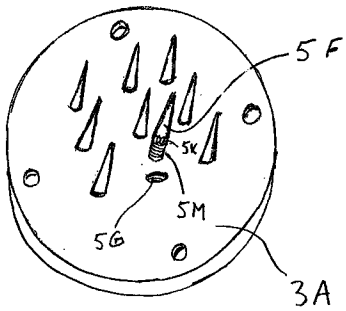


Fig 10

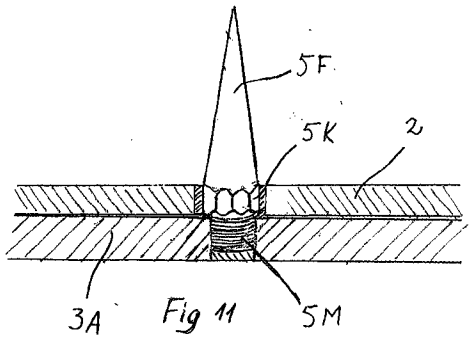


Fig 11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI2016/000023

A. **CLASSIFICATION OF SUBJECT MATTER**

See extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: B26D, B27L, A01G, B25G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

FI, SE, NO, DK B27L7/00

Electronic data base consulted during the international search (name of data base, and, where practicable, search terms used)

EPODOC, EPO-Internal full-text databases, Full-text translation databases from Asian languages, WPIAP, PRH-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2006096666 A1 (ST-GERMAIN ANDRE [CA] et al.) 11 May 2006 (11.05.2006) paragraphs [0032] and [0034]; claim 1; fig. 1	1, 2, 6, 7
Y	US 1026721 A (THOMAS HENRY [GB]) 21 May 1912 (21.05.1912) page 1, rows 90–96; page 2, rows 72–78 and 94–124; page 3, rows 28–33 and 74–89; figs. 5–8	1, 2, 6, 7
A	US 4340098 A (SCOTT GEORGE K) 20 July 1982 (20.07.1982) whole document	1–7
A	US 1257587 A (DEMUTH ALFRED M [US]) 26 February 1918 (26.02.1918) whole document	1–7

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier application or patent but published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search	Date of mailing of the international search report
16 December 2016 (16.12.2016)	20 December 2016 (20.12.2016)

Name and mailing address of the ISA/FI
Finnish Patent and Registration Office
P.O. Box 1160, FI-00101 HELSINKI, Finland
Facsimile No. +358 9 6939 5328

Authorized officer
Kari Koskenhely
Telephone No. +358 9 6939 500

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI2016/000023

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 2746010 A1 (FISKARS BRANDS FINLAND OY AB [FI]) 25 June 2014 (25.06.2014) whole document	1–7
A	DE 19703829 A1 (STOCKMANN HANS [DE]) 06 August 1998 (06.08.1998) whole document	1–7
A	US 1203256 A (PETERSON JOHN M [US]) 31 October 1916 (31.10.1916) whole document	1–7

INTERNATIONAL SEARCH REPORT
Information on Patent Family Members

International application No.
PCT/FI2016/000023

Patent document cited in search report	Publication date	Patent family members(s)	Publication date
US 2006096666 A1	11/05/2006	US 7159627 B2	09/01/2007
		CA 2525984 A1	09/05/2006
US 1026721 A	21/05/1912	None	
US 4340098 A	20/07/1982	None	
US 1257587 A	26/02/1918	None	
EP 2746010 A1	25/06/2014	EP 2746010 B1	08/07/2015
		CA 2837424 A1	20/06/2014
		CN 103878851 A	25/06/2014
		DK 2746010 T3	10/08/2015
		FI 20126351 A	21/06/2014
		FI 125227 B	15/07/2015
		RU 2013156443 A	27/06/2015
		US 2014175724 A1	26/06/2014
		US 9333671 B2	10/05/2016
DE 19703829 A1	06/08/1998	None	
US 1203256 A	31/10/1916	None	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI2016/000023

CLASSIFICATION OF SUBJECT MATTER

IPC
B26D 7/02 (2006.01)
B27L 7/00 (2006.01)