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(54) **REMOVABLE ABRASIVE SLEEVE FOR A NAIL CARE DEVICE**

(57) The invention is related to manicure or pedicure accessories, namely to nail care devices, such as hand nail files. A removable abrasive sleeve of the nail care device is proposed, which contains a base in the form of a flat or flat-oval tube, the surface of which has an abrasive working part. The abrasive working part is formed by an abrasive cloth bonded to the flat surface of the base, the base being formed by a rolled cloth of sheet material, the edges of which are fastened together to form flat surfaces on both sides of the base. The claimed invention provides an increase in the strength of the base and the reliability of the bonding of the abrasive cloth to the surface of the base.

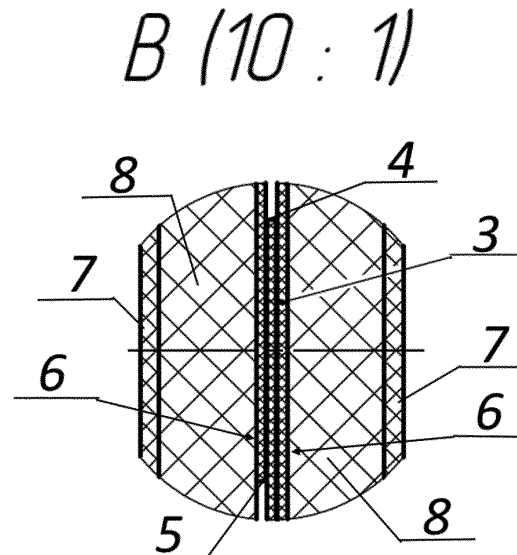


Fig. 13

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Description

[0001] The invention is related to manicure or pedicure accessories, namely to nail care devices, such as hand nail files.

[0002] There are known similar replaceable abrasives for the nail care devices, among which the closest are the following. There is a nail file containing a metal working plate, one or both sides of which have areas with an abrasive element. The abrasive element is replaceable and intended for single use only. The replaceability of the abrasive element is achieved by the fact that on one of its sides is applied an adhesive layer and by means of this layer the abrasive element is connected to the working plate (UA Patent 122100 U, published on December 26, 2017). The disadvantage of such an abrasive element is the lack of reliability of its fixation on the working plate only by means of an adhesive layer applied to one side of the abrasive element, and the possibility of shifting of the abrasive element during operation due to lack of mechanical fixation on the working plate. In this case, the reliability of fixation for such an abrasive element will depend on the quality of the adhesive layer and the strength of its adhesion to the surface of the working plate, which, in turn, will complicate the peeling of the abrasive element when replacing it.

[0003] The prototype is a removable abrasive sleeve of the device for nail care, described in UA Patent 118314 U, published on July 25, 2017. The sleeve according to the prototype contains a base in the form of a flat or flat-oval tube, the surface of which has an abrasive working part. The base provides the ability to quickly put on the working plate by moving the working plate into the cavity of the tube of the base, followed by its removal after wear of the abrasive working part and replacement with a new abrasive sleeve. The abrasive working part is made in the form of an abrasive cloth mounted on the base by gluing. The disadvantage of this solution is the insufficient strength of the base, the integrity of which can be damaged during the use of the device for nail care, for example, when it breaks, which reduces the reliability of the removable abrasive sleeve and the possibility of injury to the treated nail surface. Bonding of the abrasive cloth over the entire surface of the base, especially in the rounded flat or flat-oval tube, as well as the lack of damping of the abrasive working part of the nail care device in the design of the prototype can lead to the reduction of reliability and safety of the removable abrasive sleeve.

[0004] The invention is based on the increasing the reliability and safety of use of the removable abrasive sleeve of the device by increasing the strength of the base and the reliability of the bonding of the abrasive cloth with the surface of the base.

[0005] The problem is solved by mean of that in the removable abrasive sleeve of the nail care device, which contains a base in the form of a flat or flat-oval tube, the surface of which has an abrasive working part, according to the invention, the abrasive working part is formed by

an abrasive cloth bonded to the flat surface, where the base is formed by a folded cloth of sheet material, the edges of which are fastened together overlapping each other to form flat surfaces on both sides of the base.

[0006] The base in the form of a flat or flat-oval tube, the surface of which has an abrasive working part, allows the installation of a removable abrasive sleeve on a rigid core (for example, in the form of a flat elongated rectangular plate with rounded edges) of the nail care device by wearing a flat or flat-oval rigid core along its length. Whereas, the formation of the abrasive working part of the abrasive cloth bonded to the flat surface of the base, allows increasing the reliability of the bonding of the abrasive cloth to the surface of the base due to their contact on a flat surface over its entire area. The formation of the base of the rolled cloth of sheet material, the edges of which are overlapped with the formation of flat surfaces on both sides of the base, allows to increase the tensile strength of the base, and reduces and eliminates possible error when connecting the edges of the rolled base cloth, which increase the reliability of the entire base and simplify its manufacture, as well as improve the reliability and safety of use of a removable abrasive sleeve mounted on a rigid core.

[0007] According to one of the preferred embodiments of the invention, the abrasive cloth is bonded to the flat surface of the base with an adhesive, which increases the reliability of the connection and simplifies the manufacture of a removable abrasive sleeve.

According to another preferred embodiment of the invention, the abrasive cloth is bonded to the flat surface of the substrate by a layer of elastic material, such as ethylene vinyl acetate (EVA), glued simultaneously to the surface of the substrate and the reverse surface of the abrasive cloth, which also increases the reliability of the microporous structure of the cell type elastic material, which gives better penetration of the adhesive, as well as provide additional damping of the abrasive work surface in contact with the nail when using a nail care device with a removable abrasive sleeve, which further increases the safety of the removable abrasive sleeve. When using a layer of elastic material, its thickness should be within 0.5-1.5 mm, because tests have shown that the thickness less than the specified interval leads to virtually no damping effect, and the thickness greater than the specified interval significantly impairs the stiffness and evenness of the abrasive work surface. According to another preferred embodiment of the invention, the abrasive cloth is bonded to the flat surface of the base and additionally bonded to the opposite flat surface of the base, which increases the durability of the removable abrasive sleeve by using both sides of the base when operating the nail care device.

According to yet another preferred embodiment of the invention, the cloth made of cellulose material is used for a base. In this case, the inner surface of the base tube is coated with a layer of polymer coating made of polyethylene, applied in an amount 8-12 g/m² at a density

cellulose material cloth within 40-60 g/m². This further improves the reliability of fixing the base on the metal rigid core of the nail care device by contacting the polymer coating of the inner surface of the base with the metal surface of the core and thereby preventing the base from slipping out of the nail care device. It was experimentally determined that the layer of polymer coating of polyethylene in the amount of 8-12 g/m² at a density of cellulose material cloth within 40-60 g/m² allows to provide the necessary reliability of fixing of a removable abrasive sleeve as well as the easy removal of used sleeve from a core by its rupture.

[0008] According to another preferred embodiment of the invention, the thickness of the abrasive cloth should be at least 0.2 mm. When testing the proposed materials for the base and abrasive cloth, it was found that the use of abrasive cloth with a thickness of less than 0.2 mm can lead to accidental damage from a relatively small effort, for example, when wearing a removable abrasive sleeve on the rigid core of the nail care device.

The following are examples of removable abrasive sleeve and its use with a device for nail care, illustrated by the following drawings:

- Fig. 1, showing a plan view of a removable abrasive sleeve,
- Fig. 2, showing section A-A on Fig. 1 according to one embodiment of the invention,
- Fig. 3, demonstrates view 6 on Fig. 2,
- Fig. 4, showing view B on Fig. 2,
- Fig. 5, showing section A-A on Fig. 1 according to another embodiment of the invention,
- Fig. 6, demonstrates view 6 on Fig. 5,
- Fig. 7, showing view B on Fig. 5,
- Fig. 8, showing section A-A on Fig. 1 according to yet another embodiment of the invention,
- Fig. 9, demonstrates view 6 on Fig. 8,
- Fig. 10, showing view B on Fig. 8,
- Fig. 11, showing section A-A on Fig. 1 according to yet another embodiment of the invention,
- Fig. 12, demonstrates view 6 on Fig. 11,
- Fig. 13, showing view B on Fig. 11.

[0009] These examples and images do not limit other possible embodiments of the removable abrasive sleeve according to the invention, but only explain its essence.

[0010] Removable abrasive sleeve for a nail care device (Fig. 2-4) contains a base (1) in the form of a flat or flat-oval tube, the surface of which has an abrasive working part (2). The base (1) is formed by a folded cloth (3) of sheet material, the edges of which (4) and (5) are fastened together to form flat surfaces (6) on both sides of the base (1). The cellulose material cloth (3), such as kraft paper with a density in the range of 40-60 g/m² is used for the base (1). On the surface of the cloth (3), which forms the inner surface of the base tube (1), is applied a layer of polymer coating - polyethylene. The amount of such a polymer coating of polyethylene for the

cloth (3) is in the range of 8-12 g/m². Alternatively, the base (1) can be made entirely of polyethylene.

[0011] The abrasive working part (2) is formed by an abrasive cloth (7) bonded to the flat surface (6) of the base (2) by an adhesive. The thickness of the abrasive cloth is 0.2 mm. As one embodiment (Fig. 5-7), the abrasive cloth (7) is bonded to the flat surface (6) of the base (2) by a layer of elastic material (8), for example, ethylene vinyl acetate (EVA). The layer of elastic material (8) is glued simultaneously to the surface of the base (1) and to the reverse surface of the abrasive cloth (7). According to yet another embodiment (Fig. 8-10), the abrasive cloth (7) is bonded to the flat surface (6) of the base (2) and additionally bonded to the opposite flat surface (6) of the base (2). According to yet another embodiment (Fig. 11-13), the abrasive cloth (7) is bonded to the flat surface (6) of the base (2) by a layer of elastic material (8) and additionally bonded to the opposite flat surface (6) of the base (2) also by a layer of elastic material (8). For these embodiments can be used an abrasive cloth (7) of the same grain size or different grain size on different flat surfaces (6) of the base (2). The thickness of the layer of elastic material (8) is in the range of 0.5-1.5 mm, for example, 1 mm.

[0012] The above-described removable abrasive sleeve mounted on the rigid core of the nail care device (not shown in the figures, but it is clear that it may be in the form of a flat metal work plate with rounded edges, or a plate of rectangular or other cross section) can be used as manicure or pedicure tool. Before use, the removable abrasive sleeve is mounted on a rigid core by putting it on. During operation, the sleeve is held on a rigid core without additional mechanical fastening or other means, such as adhesive bonding and the like. This fixation of the sleeve to the nail care device is achieved due to the tight fit of the base (1) on the rigid core. This ensures easy and free installation of the sleeve without excessive effort. Then the flat surface (6) of the base (2) with the abrasive cloth (7) is placed parallel to the surface of the nail and nail care is performed by contact of the abrasive working part (2) with the nail. The layer of elastic material (8) when used allows softening the contact of the abrasive working part (2) with the nail and increasing the safety and convenience of working with the device for nail care. Removal of the removable abrasive sleeve is carried out by tearing (rupturing) the base cloth (1) by applying a certain force to it. In the case of using a removable abrasive sleeve with an abrasive cloth (7) located on both flat surfaces (6) of the base (2) alternately use each abrasive working part (2) or a flat surface (6) with an abrasive working part (2) of the desired grain size.

[0013] Such a removable abrasive sleeve can be made of a certain length, the size of the rigid core of the device for nail care, or in the form of a roll containing parts divided by the weakened areas of material, obtaining after the torn off a removable abrasive sleeve of the desired length.

[0014] Thus, the claimed the invention provides an in-

crease in the strength of the base and the reliability of the bonding of the abrasive cloth to the surface of the base.

5

Claims

1. A removable abrasive sleeve of the nail care device, which contains a base in the form of a flat or flat-oval tube, the surface of which has an abrasive working part, **characterized in that** the abrasive working part is formed by an abrasive cloth bonded to the flat surface of the base, the base is formed by a rolled cloth of sheet material, the edges of which are fastened together to form flat surfaces on both sides of the base. 10 15
2. A removable abrasive sleeve according to claim 1, **characterized in that** the abrasive cloth is bonded to the flat surface of the base with an adhesive. 20
3. A removable abrasive sleeve according to claim 1, **characterized in that** the abrasive cloth is bonded to the flat surface of the base by a layer of elastic material, such as ethylene vinyl acetate (EVA), bonded simultaneously to the surface of the base and to the back surface of the abrasive cloth. 25
4. A removable abrasive sleeve according to claim 3, **characterized in that** the thickness of the layer of elastic material is in the range of 0.5-1.5 mm. 30
5. A removable abrasive sleeve according to claim 2 and claim 3, **characterized in that** the abrasive cloth is bonded to the flat surface of the base and additionally bonded to the opposite flat surface of the base. 35
6. A removable abrasive sleeve according to claim 1, **characterized in that** the cellulose material cloth is used as a base. 40
7. A removable abrasive sleeve according to claim 6, **characterized in that** the layer of polymer coating is applied to the inner surface of the base tube. 45
8. A removable abrasive sleeve according to claim 7, **characterized in that** the layer of polymer coating is made of polyethylene, applied in an amount of 8-12 g/m² at a density of cellulose material cloth within the range of 40-60 g/m². 50
9. A removable abrasive sleeve according to claim 1, **characterized in that** the thickness of the abrasive cloth is not less than 0.2 mm. 55

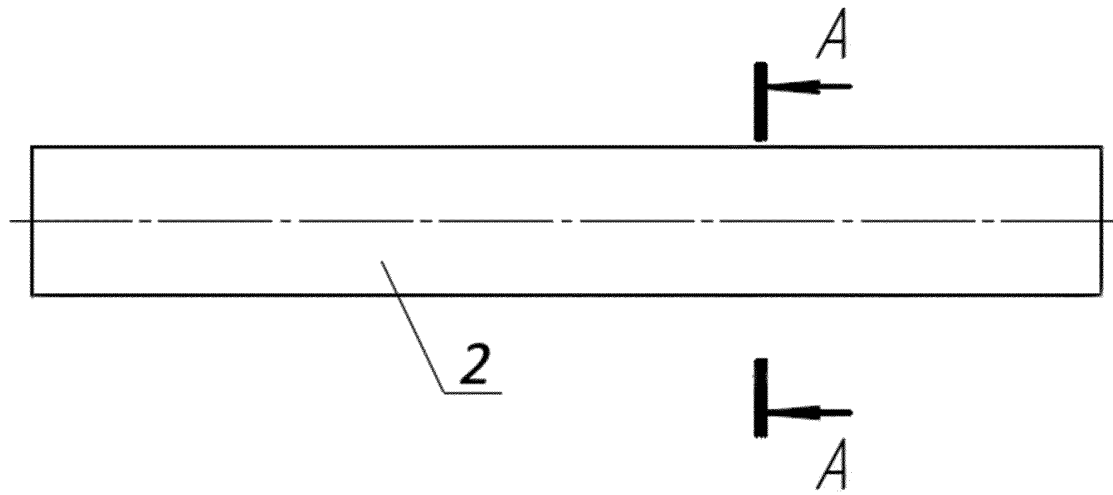


Fig. 1

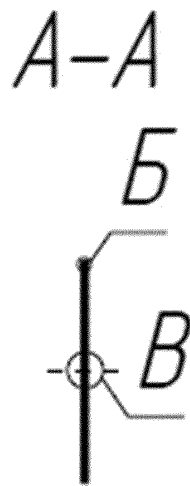


Fig. 2

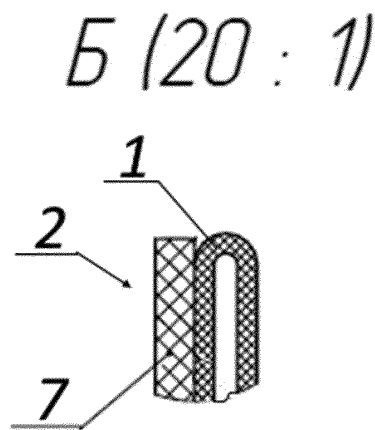


Fig. 3

B (20 : 1)

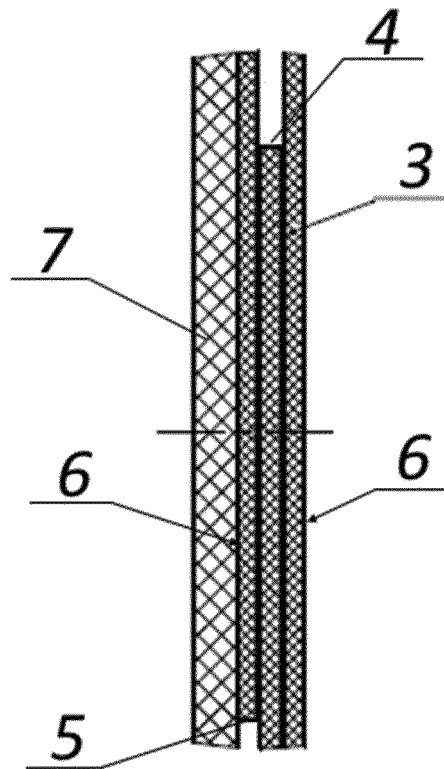


Fig. 4

A-A



Fig. 5

Б (10 : 1)

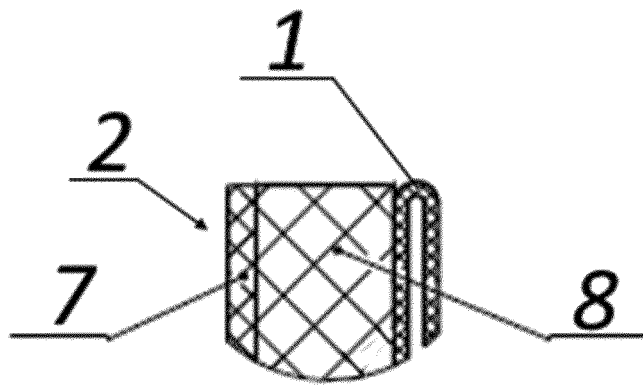


Fig. 6

В (10 : 1)

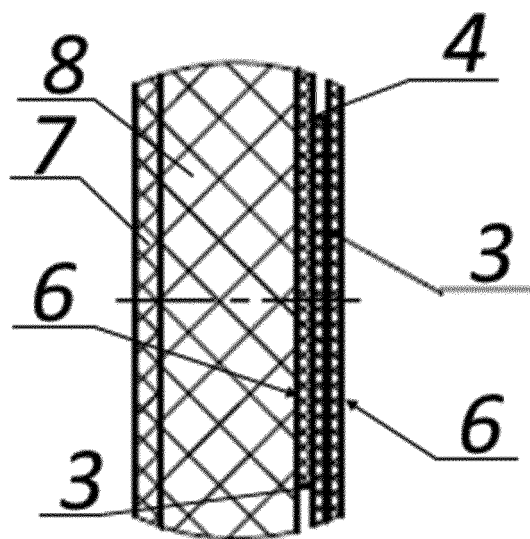


Fig. 7

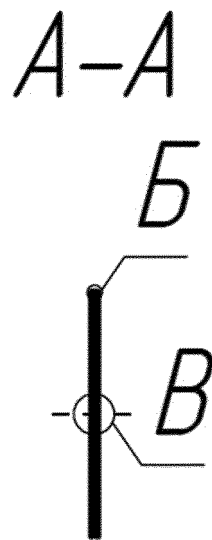


Fig. 8

Б (20 : 1)

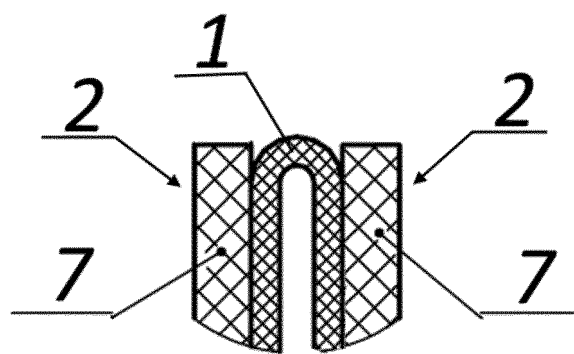


Fig. 9

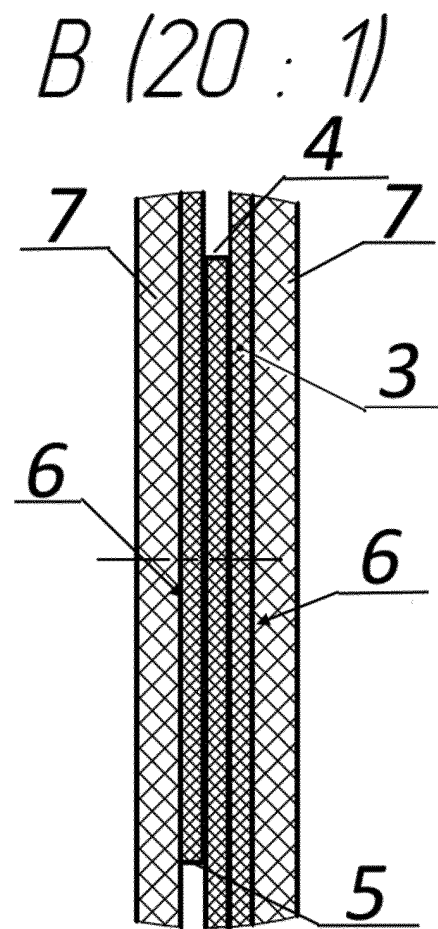


Fig. 10

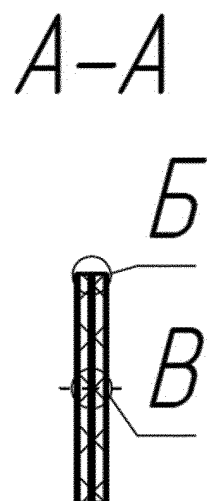


Fig. 11

B (10 : 1)

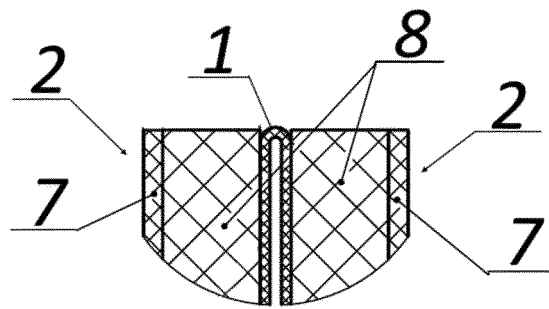


Fig. 12

B (10 : 1)

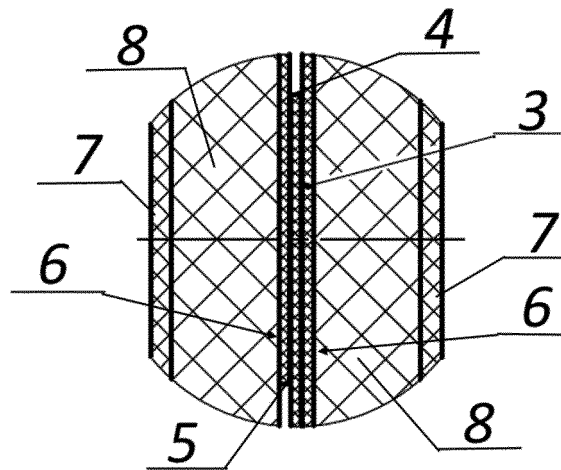


Fig. 13

INTERNATIONAL SEARCH REPORT

International application No.

PCT/UA2020/000085

A. CLASSIFICATION OF SUBJECT MATTER A45D29/04 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) A45D29/04 A45D2029/045																		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched																		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Espacenet																		
C. DOCUMENTS CONSIDERED TO BE RELEVANT																		
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>D, Y</td> <td>UA 118314 U (KOLODIAZHNY OLEKSY VALERIIHOVYCH [UA]) 25 July 2017 g. (2017-07-25) claims 1, 4, 8; p. 1, line 57 - p. 2, line 12; fig. 7, 1 1)</td> <td>1-3, 5, 6, 9</td> </tr> <tr> <td>Y</td> <td>JP S6048264 A (ABO RIYOUZOU [JP]) 15 March 1985 (1985-03-15) (abstract; fig. 1-6)</td> <td>1-3, 5, 6, 9</td> </tr> <tr> <td>Y</td> <td>CN 209983673 U (ZHONG ZHIFENG [CN]) 24 January 2020 (2020-01-24) (abstract; par. [0038]; fig. 1)</td> <td>3</td> </tr> <tr> <td>Y</td> <td>US 7572484 B1 (DALEY SCOTT G [US]) 11 August 2009 (2009- 08-11) (col. 9, line 59 - col. 10, line 10; fig. 6)</td> <td>3, 4</td> </tr> <tr> <td>Y</td> <td>US 5088509 A (SAVAGE III ARTHUR N [US]) 18 February 1992 (1992-02-18) (col. 3, line 42 - col. 4, line 2; fig. 4, 5, 7)</td> <td>5</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	D, Y	UA 118314 U (KOLODIAZHNY OLEKSY VALERIIHOVYCH [UA]) 25 July 2017 g. (2017-07-25) claims 1, 4, 8; p. 1, line 57 - p. 2, line 12; fig. 7, 1 1)	1-3, 5, 6, 9	Y	JP S6048264 A (ABO RIYOUZOU [JP]) 15 March 1985 (1985-03-15) (abstract; fig. 1-6)	1-3, 5, 6, 9	Y	CN 209983673 U (ZHONG ZHIFENG [CN]) 24 January 2020 (2020-01-24) (abstract; par. [0038]; fig. 1)	3	Y	US 7572484 B1 (DALEY SCOTT G [US]) 11 August 2009 (2009- 08-11) (col. 9, line 59 - col. 10, line 10; fig. 6)	3, 4	Y	US 5088509 A (SAVAGE III ARTHUR N [US]) 18 February 1992 (1992-02-18) (col. 3, line 42 - col. 4, line 2; fig. 4, 5, 7)	5
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Date of the actual completion of the international search 03 March 2021 (03.03.2021)	Date of mailing of the international search report 17 March 2021 (17.03.2021)																	
Name and mailing address of the ISA/ UA Facsimile No.	Authorized officer Telephone No.																	

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/UA2020/000085

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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Y	JP S5675104 A (YOSHIYU NOKAMA [JP]) 22 June 1981 (1981-06-22) (fig. 1, 3, 4)	5
A	US 3339562 A (LENTON ROWE COLIN [US]) 05 September 1967 (1967-09-05) (the whole document)	1-9
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A	US 2103320 A (COREL EDWARD V [US]) 28 December 1937 (1937-12-28) (the whole document)	1-9

Form PCT/ISA/210 (continuation of second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/UA2020/000085

UA 118314 U	2017-07-25	None	
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US 2103320 A	1937-12-28	None	

REFERENCES CITED IN THE DESCRIPTION

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- UA 118314 U [0003]