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(54) Title: AN ASGUN SAPHENOUS FORCEPS

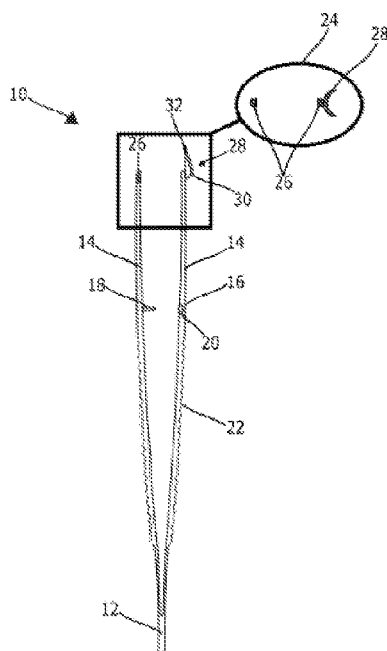


Figure 2

(57) Abstract: An Asgun saphenous forceps having a plurality of handles (14) provided in rod form connected to a hinge (12), comprising a DeBakey atraumatic tip (26) provided at a mouth (24) of each handle (14), and a shield (28) having a bulbous lower portion (30) and provided in the form of a tip tapering from the lower portion to an upper portion (32), welded to the atraumatic tip (26) of at least one of the handles (14).



AN ASGUN SAPHENOUS FORCEPS

Technical Field

The invention relates to an Asgun saphenous forceps comprising a plurality of handles
5 provided in rod form connected to a hinge.

Prior Art

In coronary bypass surgery, vessels (grafts) harvested from the patient's body are sewn to the coronary arteries and aorta (anastomosis). The quality of this procedure determines the patient's life expectancy and quality of life after the operation. The most commonly used
10 vein is the saphenous vein, which is removed from the inner side of the leg. When suturing the saphenous vein to the coronary artery and aorta, the mouth and the inside of the saphenous vein should be kept fixed so that the surgeon can easily see it. If the surgeon has a good field of vision on both the heart vein and this graft, the sutures can be applied where they should be and the two veins fit precisely on top of each other and join perfectly. The
15 correct fusion of the two vessels prevents stenosis at the suture site and ensures that the blood supply to the patient's heart flows smoothly after the operation. It prevents early occlusion of the vessel and bleeding from the suture line. Currently, the saphenous vein is held in place with a standard vascular forceps by the assistant surgeon while the vein is sutured (anastomosed) to the heart vessel. As a vein, the wall of the saphenous vein is very thin.
20 When its tip is held on one side for suturing, the lips forming the rim of the mouth come very close to each other and often stick together. This causes the mouth part to be sutured to the heart vessel or aorta to close. The surgeon has to perform various manoeuvres to move the lips that are too close or stuck together away from each other in order to pass the needle through the right place. This makes it difficult for the needle used for suturing to pass through
25 the vessel wall, distracts the surgeon and wastes time. In addition, since the inside of the vessel is not fully visualized, sometimes the needle may accidentally bite through the posterior wall, which may cause blockage of the anastomosis (joining of the vessels). If such a situation is not recognized in time, it can lead to fatal consequences. Saphenous forceps can be used to prevent the saphenous vein vessels from sticking and to prevent the bite from
30 the vein and to prevent fatal consequences.

It is well known that forceps are used in vascular surgical operations, in particular for performing surgical operations without damaging the vessel. Accordingly, the invention numbered US6261308 relates to a medical forceps for vascular surgery. In the invention, the forceps are developed to provide the vascular surgeon with the ability to cross-clamp and/or sequentially side clamp a damaged vein without puncturing, tearing or otherwise damaging the vein. However, for the anastomosis of the saphenous vein to the heart vessels, the forceps do not have a shield tip at the end to prevent damage to the posterior portion of the vessel. It is also not ergonomic compared to the tweezer-like form, as it is shaped like a pair of scissors and not like a pair of tweezers.

- 10 As a result, all the above-mentioned problems have made it imperative to innovate in the relevant technical field.

Objects of the Invention

- 15 The present invention relates to an Asgun saphenous forceps to overcome the aforementioned disadvantages and to introduce new advantages to the relevant technical field.

An object of the invention relates to an Asgun saphenous forceps, which is a surgical instrument that allows the saphenous vein, which is removed from the patient's leg to be held with its mouth open while bypassed to the heart vessel in heart surgeries and to facilitate the suturing process.

- 20 Another object of the invention relates to an Asgun saphenous forceps which, by means of its shield, facilitates suturing (anastomosis) by allowing the end of the saphenous vein to be sutured to the cardiac artery to be opened wide, preventing loss of time and preventing the needle from accidentally passing through the posterior wall.

Brief Description of the Invention

- 25 In order to fulfil all of the above-mentioned objects and those which will arise from the following detailed description, the present invention is an Asgun saphenous forceps comprising a plurality of handles provided in rod form so as to be connected to a hinge. Accordingly, the novelty is that each handle comprises a DeBakey type atraumatic tip provided at a mouth portion, and a shield welded to the atraumatic tip of at least one of the

handles, having a lower portion with a bulbous shape and a tip narrowing from the lower portion to an upper portion. Thus, during the suturing of the saphenous vein, which is removed from the leg of a patient, to the heart vessel, a surgical instrument is obtained in which the shield structure ensures that no bite is taken from the posterior wall of the vessel, thus opening the mouth of the vessel and facilitating the suturing process. Here, the forceps has a shield on the atraumatic end of one of the two handles to prevent a bite from being taken from the vein.

A possible embodiment of the invention is characterized in that it comprises a first form in which the atraumatic tip is provided with a straight shape. Thus, the first form of the Asgun saphenous forceps is provided with a non-directional form suitable for both right- and left-handed use by the surgeon.

A possible embodiment of the invention is characterized in that it comprises a second form in which each handle is provided with an oppositely convex bending from zero to one hundred and eighty degrees from a bending area, and the shield is in an angled position in a first direction. Thus, the second form of the Asgun saphenous forceps provides a directional form in which the surgeon can perform the surgical operation using the right hand.

A possible embodiment of the invention is characterized in that it comprises a third form in which each handle is provided with an oppositely convex bending from zero to one hundred and eighty degrees from a bending area, and the shield is in an angled position in a second direction. Thus, the third form of the Asgun saphenous forceps provides a directional form in which the surgeon can perform the surgical operation using the left hand.

A possible embodiment of the invention is characterized in that it comprises a pin and a pin hole provided corresponding to each other on the inside of each lateral wall of the handles. Thus, when the handles are compressed from the sides, the pin is inserted into the pin hole to close the gap distance of the forceps.

A possible embodiment of the invention is characterized in that it comprises a plurality of grooves of a non-slip nature, which are cut on an inner part and an outer part of the lateral wall. Thus, a holding area is provided for the surgeon to hold the forceps without slipping them out of his hand.

A possible embodiment of the invention is characterized in that the Asgun saphenous forceps are made of a rustproof metallic material. Thus, the strength of the Asgun saphenous forceps is ensured.

Brief Description of the Figures

5 Figure 1 illustrates a side view of the Asgun saphenous forceps according to the invention.

Figure 2 is a continuation of Figure 1.

Figure 3 illustrates an external view of the Asgun saphenous forceps from the shield side according to the invention.

10 Figure 4 illustrates an external view of the Asgun saphenous forceps from the non-shield side according to the invention.

Figure 5 illustrates a first form of the Asgun saphenous forceps according to the invention having a straight mouth.

Figure 6 illustrates a second form of the mouth of the Asgun saphenous forceps according to the invention.

15 Figure 7 illustrates a third form of the mouth of the Asgun saphenous forceps according to the invention.

Figure 8 shows a use case of the Asgun saphenous forceps according to the invention.

Detailed Description of the Invention

20 In this detailed description, the Asgun saphenous forceps according to the invention are only described by way of non-limiting examples for a better understanding of the subject matter.

Figure 1 and Figure 2 show the inventive Asgun saphenous forceps from the side, Figure 3 shows the shield side of the Asgun saphenous forceps according to the invention from the outside, Figure 4 shows the non-shield side of the inventive Asgun saphenous forceps according to the invention from the outside, and Figure 5 shows a first form of the inventive
25 Asgun saphenous forceps according to the invention with a straight mouth, Figure 6 shows a second form of the mouth of the Asgun saphenous forceps according to the invention,

Figure 7 shows a third form of the mouth of the Asgun saphenous forceps according to the invention and Figure 8 shows a use case of the Asgun saphenous forceps according to the invention.

An asgun saphenous forceps (10) comprises a plurality of handles (14) provided in the form of rods in connection with a hinge (12). Each handle (14) has a debakey atraumatic tip (26) provided at a mouth (24) portion. At least one of the handles (14) has a shield (28) welded to the atraumatic tip (26), wherein a lower portion (30) is provided in a form having a bulbous structure and a tapered tip from the lower portion to an upper portion (32). In this way, during the suturing of the saphenous vein, which is removed from the leg of a patient, to the heart vessel, the shield (28) structure ensures that no bite is taken from the back wall of the vein, thus opening the mouth of the vein and facilitating the suturing process. Here, the forceps (10) has a shield (28) at the atraumatic tip (26) of one of the two handles (14) to prevent a bite from being taken from the vessel. The invention is particularly used in heart surgery for bypassing a heart vessel. In addition, the surgical instrument with the asgun saphenous forceps (10), thanks to the special tip shield (28) shown in Figure 1 and Figure 2, enables the saphenous vein to be sutured to the heart vein to be opened wide, facilitating the suturing (anastomosis), preventing loss of time and preventing the needle from accidentally passing through the posterior wall. The invention can also be used for suturing other veins and artificial veins similar to the saphenous vein. The handle (14) is a rod having a curved structure. Here, the curved structure of the handle (14) is in the form of a standard straight forceps body. Also, in one configuration of the invention, the handle (14) has a rounded form. The curved structure of each handle (14) has a width at its widest point of 10 mm and a length of 190 mm. The distance between the handles (14) is 19 mm. The width of the atraumatic tips (26) is 2 mm, so that the net distance at the upper tips of the handles (14) is 15 mm. In the Asgun saphenous forceps (10) according to the invention, the shield (28) has a length of 12 mm and, due to its bulbous structure, its widest part is 7 mm as an arc path in its lower part. The shield (28) resembles a triangle with rounded edges and is curved with a curvature of $1/3$ along its long axis. When the saphenous vein is grasped with the vascular forceps to which it is attached, the shield (28) of the invention in the forward protruding position enters the vein and opens the vein's mouth to both sides as shown in Figure 8. In this case, both the vein lips move away from each other and the suture line becomes easily visible to the surgeon. Moreover, the shield (28) forms a barrier in front of the posterior wall of the vein, preventing the needle from taking a bite. This makes it easier to guide the tip of

the suture needle while passing through the vessel wall during the use of the Asgun saphenous forceps (10). The inner side of the tip of the forceps (10) used to hold the vessel has a DeBakey-type serration so as not to damage the tissue. This type of serration is standard for surgical instruments used in cardiovascular surgeries. Thus, the forceps (10) designed

5 have an atraumatic characteristic. The hinge (12) in the invention is the weld that joins the two handles (14), i.e. legs, of the forceps (10). The handles (14) flex from this part and the tips remain open when not compressed. In one embodiment of the invention, the Asgun saphenous forceps (10) comprises a first form (34) in which the atraumatic tip (26) is provided with a straight shape. In this way, the first form (34) of the Asgun saphenous

10 forceps (10) is provided in a non-directional form suitable for both right- and left-handed use by the surgeon. Here, the atraumatic tip (26) is provided in the straight first form (34) as a straight tip (260) as shown in Figure 5. In the first form (34) the shield (28) is welded to the configured straight end (260) of the atraumatic end. In one embodiment of the invention, the Asgun saphenous forceps (10) comprise a second form (36) in which each handle (14) is

15 provided with an oppositely convex bending of a bending area (140) from 0 to 180 degrees, and the shield (28) is angled in a first direction (A). In this way, the second form (36) of the Asgun saphenous forceps (10) provides a directional form in which the surgeon can perform the surgical operation using the right hand. Here, the atraumatic tip (26) is in the form of a first angled tip (262) at an angle between 0 and 180 degrees, preferably at an angle of 45

20 degrees. In the second form (36) the shield (28) is welded at the configured first angled end (262) of the atraumatic tip shown in Figure 6. Here, the shield (28) is at the left-hand end of the handle (14) so that the surgeon can use the Asgun saphenous forceps (10) with the right hand, and the right-hand end of the handle (14) provides only the DeBakey-type atraumatic serration for the surgeon's right-handed use. In other words, the right-side handle (14) is

25 without a shield (28). Here, the first angled end (262) without a shield (28) has an angle of 45 degrees to the right side so that the surgeon can hold the forceps (10) in an ergonomic position with the right hand. In another embodiment of the invention, the Asgun saphenous forceps (10) comprise a third form (38) in which each handle (14) is provided with oppositely convex bending of a bending area (140) from 0 to 180 degrees, and the shield (28) is angled

30 in a second direction (B). In this way, the third form (38) of the Asgun saphenous forceps (10) is provided in a directional form in which the surgeon can perform the surgical operation using the left hand. Here, the atraumatic tip (26) is in the form of a second angled tip (264) at an angle between 0 and 180 degrees, preferably at an angle of 45 degrees. In the third form (36) the shield (28) is welded at the configured second angled tip (264) of the

atraumatic tip shown in Figure 7. Here, the shield (28) is at the right-hand end of the handle (14) so that the surgeon can use the Asgun saphenous forceps (10) with the left hand, while the left-hand end of the handle (14) provides only DeBakey-type atraumatic serration for the surgeon's left-handed use. In other words, the left side handle (14) is without a shield (28).

Here, in order for the surgeon to hold the forceps (10) in an ergonomic position with his left hand, the second angled tip (264) part without a shield (28) has an angle of 45 degrees to the left side. The angled versions provided with the angled forms (36) (38) of the Asgun saphenous forceps (10) of the invention make the forceps ergonomic, and an assistant surgeon can use the forceps (10) by keeping his arm and hand in a natural posture. This feature both facilitates the correct positioning of the vessel and reduces the fatigue of the surgeon's hand and arm during long operations. In the invention, each lateral wall (16) of the handles (14) has a pin (18) and a pin hole (20) provided from the internal portion (160) of each lateral wall (16). In this way, when the handles (14) are compressed from the sides, the pin (18) enters the pin hole (20) to close the gap distance of the forceps (10). Here, the pin (18) is a guide protrusion which ensures that the handles (14) are exactly opposed when closed. In the invention, the pin (18) is located on the internal portion (160) of one of the handles (14) and enters the pin hole (20) in the opposite handle (14). In this case, when the forceps (10) are compressed, the atraumatic tips (26) press against each other. The pin hole (20) in the invention is the hole into which the pin (18) in the opposite handle (14) enters. This structure ensures that the forceps handles (14), i.e. the legs, are fully opposed. In the invention, the forceps (10) have a plurality of grooves (22) in a non-slip structure, which are cut on the internal portion (160) of the lateral wall (16) and an external portion (162). In this way, a holding area is provided for the surgeon to hold the forceps without slipping it from his/her hand. Here, the non-slip grooves (22) are formed along a predetermined area on the internal portion (160) shown in Figure 3 and on the external portion (162) shown in Figure 4. In the invention, the Asgun saphenous forceps (10) are made of a rustproof metallic material, thereby providing strength.

Reference Numbers Given in the Figure

10 Asgun saphenous forceps	260 Straight tip
12 Hinge	262 First angled tip
14 Handle	264 Second angled tip
140 Bending area	28 Shield

16 Lateral wall	30 Bottom part
160 Inner portion	32 Upper part
162 External portion	34 First form
18 Pin	36 Second form
20 Pin hole	38 Third form
22 Groove	A First direction
24 Mouth	B Second direction
26 Atraumatic tip	

CLAIMS

1. An Asgun saphenous forceps having a plurality of handles (14) provided in rod form connected to a hinge (12), **characterized by** comprising a DeBakey atraumatic tip (26) provided at a mouth (24) of each handle (14), and a shield (28) having a bulbous lower portion (30) and provided in the form of a tip tapering from the lower portion to an upper portion (32), welded to the atraumatic tip (26) of at least one of the handles (14).
2. An Asgun saphenous forceps according to claim 1, **characterized by** comprising a first form (34) in which the atraumatic tip (26) is provided with a straight shape.
3. An Asgun saphenous forceps according to claim 1, **characterized by** comprising a second form (36) in which each handle (14) is provided with an oppositely convex bend from 0 to 180 degrees from a bending area (140) and the shield (28) is in an angled position in a first direction (A).
4. An Asgun saphenous forceps according to claim 1, **characterized by** comprising a third form (38) in which each handle (14) is provided with an oppositely convex bend from 0 to 180 degrees from a bending area (140) and the shield (28) is in an angled position in a second direction (B).
5. An Asgun saphenous forceps according to any of the preceding claims, **characterized by** comprising a pin (18) and a pin hole (20) corresponding to each other from the inner portion (160) of each lateral wall (16) of the handles (14).
6. An Asgun saphenous forceps according to any of the preceding claims, **characterized by** comprising a plurality of grooves (22) formed on an inner portion (160) and an outer portion (162) of the lateral wall (16) with a non-slip structure.
7. An Asgun saphenous forceps according to any of the preceding claims, **characterized by** the Asgun saphenous forceps (10) being of a rustproof metallic material.

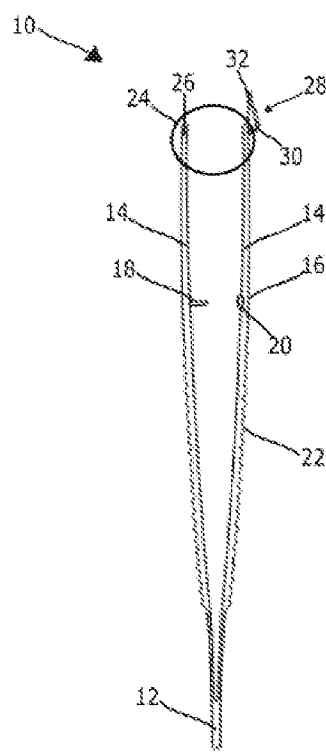


Figure 1

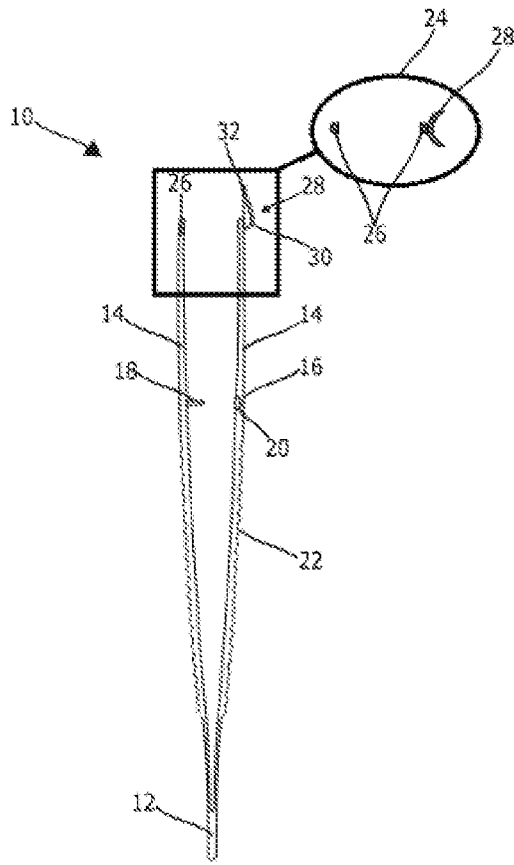


Figure 2

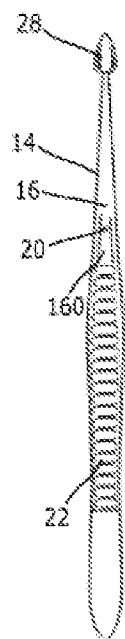


Figure 3

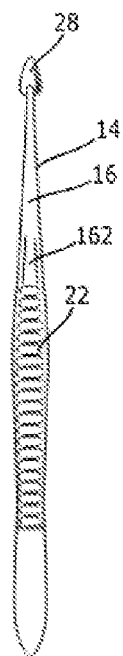


Figure 4

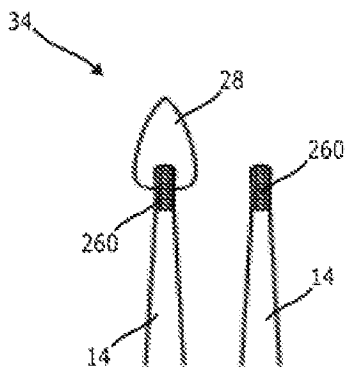


Figure 5

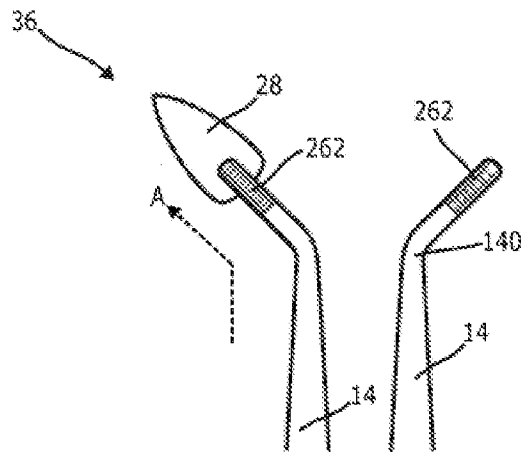


Figure 6

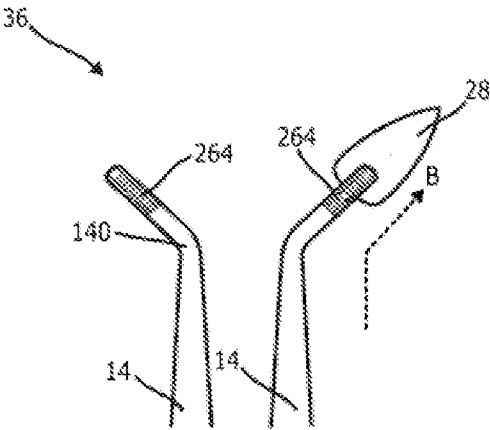


Figure 7

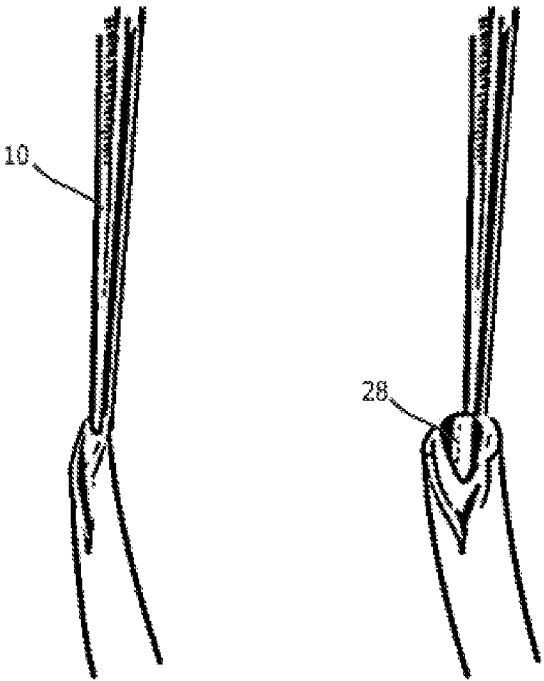


Figure 8

INTERNATIONAL SEARCH REPORT

International application No.

PCT/TR2024/050475

A. CLASSIFICATION OF SUBJECT MATTER

A61B 17/28(2006.01)i; A61B 17/30(2006.01)i

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)

A61B

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)

EPODOC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 213606701 U (SERGEANT SCHOOL THIRD MILITARY MEDICAL UNIV) 06 July 2021 (2021-07-06) Whole document	1-7
A	GB 2073086 A (SINHA A) 14 October 1981 (1981-10-14) Whole document	1-7
A	CN 209032539 U (XIAMEN EYE CENTER OF XIAMEN UNIV CO LTD) 28 June 2019 (2019-06-28) Whole document	1-7
A	CN 103750883 A (ZHANG GUANGYUN) 30 April 2014 (2014-04-30) Whole document	1-7



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Date of the actual completion of the international search

19 July 2024

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT
Information on patent family members

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Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN	213606701	U	06 July 2021	NONE	
GB	2073086	A	14 October 1981	GB 2073086 B	04 January 1984
CN	209032539	U	28 June 2019	NONE	
CN	103750883	A	30 April 2014	NONE	