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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
10 March 2022 (10.03.2022)

WIPO | PCT

(10) International Publication Number
WO 2022/049155 A1

(51) International Patent Classification:
A47L 23/26 (2006.01)

(21) International Application Number:
PCT/EP2021/074180

(22) International Filing Date:
01 September 2021 (01.09.2021)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
102020000020977 03 September 2020 (03.09.2020) IT

(71) Applicant: **FENIX GROUP SOCIETA' A RESPONSABILITA' LIMITATA** [IT/IT]; Via V. Agostinone, 9, 65015 MONTESILVANO (PE) (IT).

(72) Inventor: **CAVALLETTI, Gianluca**; Via Dante Alighieri, 12, 65015 MONTESILVANO (PE) (IT).

(74) Agent: **BALDI, Claudio**; Viale Cavallotti, 13, 60035 JESI (AN) (IT).

(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, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN, KP, KR, KW, 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, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, 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:
— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

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

(54) Title: DECONTAMINATION DEVICE FOR SHOE OUTSOLES

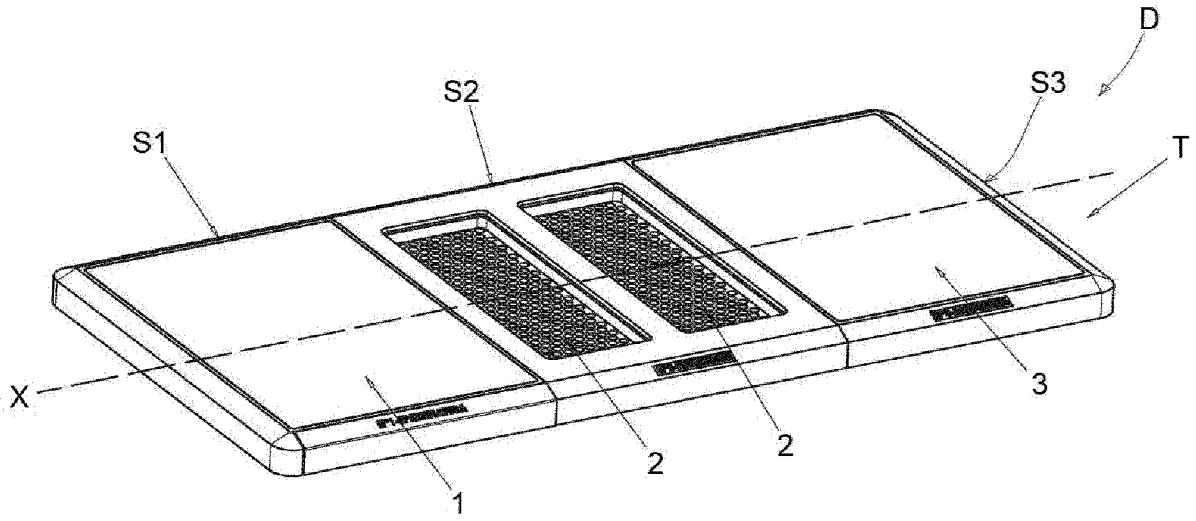

FIG. 1

(57) Abstract: Decontamination device (D) for shoe outsoles comprising a base frame (T) provided with a brushing station (S1), a decontamination station (S2), and a drying station (S3); said decontamination device (D) also comprising a first carpet (1) disposed in correspondence of said brushing station (S1), at least one tub (2) disposed in the decontamination station (S2) that contains a sanitizing/decontamination liquid, and a second carpet (3) disposed in correspondence of said drying station (S3).

WO 2022/049155 A1

DECONTAMINATION DEVICE FOR SHOE OUTSOLES

DESCRIPTION

The present patent application for industrial invention relates to a decontamination device of shoe outsoles suitable for being generally positioned in the threshold of an enclosed space.

The present invention has been devised to provide a solution to the problems arising from the advent of the contingent coronavirus (Covid 19) pandemic that can be fought or at least slowed down, first of all, by respecting good hygienic habits.

Good hygienic habits comprise the frequent washing and sanitizing of the hands, the mouth, and the entire body, the cleaning of clothing, and the sanitation of the environment. Moreover, it has been recently discovered that even the outsoles of shoes or parts of objects in contact with the ground can be vectors of bacteria and the like and therefore must be sanitized.

In particular, outsoles pick up infected material from asphalt or the ground, which can then be transported to homes, offices, hospitals and public places where a person has access.

Although the importance of such an issue has increased with the advent of the coronavirus, the cleaning and sanitizing of shoes is a healthy habit that should be adopted whenever a person enters an enclosed space in order to prevent dirt, bacteria, viruses and pathogens from being introduced into such enclosed space.

It is precisely the issue of shoe sanitizing that this invention intends to remedy.

Shoes are currently sanitized with empirical methods by pouring a small amount of water and disinfectant on a tissue or on a piece of cloth and rubbing it on the shoes.

Such a solution is uncomfortable and difficult, especially if the person wearing the shoes has walking problems or physical problems in general. Moreover, such a solution does not provide a thorough cleaning of the shoes.

In order to overcome this problem, tubs with low height that contain a sanitizer/disinfectant have been positioned at the entrance of enclosed spaces.

By stepping over the tub, the user partially immerses the outsole in the liquid so as to sanitize it.

In any case, such a solution cannot be considered completely satisfactory for the following reasons.

Firstly, considering that dirt, dust, organic substances and many other materials are deposited on the outsole, as soon as the outsole touches the water, a large part of these elements is released inside the tub, and therefore the sanitizing liquid contained in the tub must be changed frequently during the day.

Additionally, after the outsoles of the shoes have been sanitized, when the user removes the shoes from the tub, the shoes are wet and consequently release the liquid in the enclosed space, with the risk of slipping for the person who is wearing the shoes.

For such a reason, doormats or carpets are usually provided in the vicinity of said tubs in order to dry off the shoes.

However, the provision of two separate elements is cumbersome. Additionally, the doormat or carpet may move during the rubbing of the outsoles of the shoes for drying purposes, thus forcing the user to continuously reposition said doormat or carpet in the vicinity of the tub.

DE20202010244 discloses a decontamination device for shoe outsoles that comprises a base frame with three stations disposed in side by side position or disposed one after the other one, namely a brushing station, a decontamination station and a drying station. The device also comprises:

- a first carpet in the brushing station,
- at least one fluid-tight tub disposed in the decontamination station,
- and a second carpet in the drying station.

CN108720791 discloses a shoe sole cleaning machine with spray disinfection function for high-heeled shoes provided with a cleaning station that contains a cleaning element and whereon spraying heads are provided to spray a disinfecting substance towards the outsole and the upper.

US5996160 discloses an entry door mat used for cleaning the outsoles of shoes. The door mat has a reservoir for a sanitizing liquid and a plurality of cylindrical brushes disposed inside the reservoir and provided with bristles that project from the open top of the reservoir, in such a way to go in contact with the outsole of a user, and bristles immersed in the liquid. Preferably the brushes

are rotatable in such a way that, when they pass through the reservoir, the brushes can take the liquid from the reservoir and apply the liquid onto the outsole. The door mat is also provided with wiping portions to remove large sized debris from the outsoles of the user, and with a fabric material for drying the outsoles after the application of the sanitizing liquid.

In view of the above, the purpose of the present invention is to devise a device for decontaminating the outsoles of shoes, which is preferably positioned in front of the entrance of an enclosed space, which allows for:

- a thorough sanitization of the outsoles of the shoes;
- a pre-brushing of the outsole of the shoe before the outsole is sanitized;
- a drying of the outsole in such a way that, before entering an enclosed space (house, office, or the like), the outsole is dry, thus reducing risks of slips and falls for the person who is wearing the shoes.

Another purpose of the present invention is to devise a device for decontaminating the outsoles of shoes that is simple and inexpensive to realize.

A further purpose of the present invention is to devise a decontamination mat that has a small volume during storage and transportation.

These purposes are achieved according to the invention with the characteristics of the appended independent claim 1.

Advantageous embodiments appear from the dependent claims.

The decontamination device according to the invention is defined by claim 1.

For the sake of clarity, the description of the decontamination device according to the invention continues with reference to the appended drawings, which have a merely illustrative, not limiting value, wherein:

Fig. 1 is an axonometric view of the decontamination device according to the invention;

Fig. 1A is an axonometric bottom view of the decontamination device according to the invention;

Fig. 2 is an exploded axonometric view of the decontamination device according to the invention;

Figs. 3, 4 and 5 are diagrammatic axonometric views of the decontamination device that illustrate step by step the way in which the

decontamination device is used for cleaning, sanitizing and drying the outsoles of shoes.

With reference to Figs. 1 and 2, a decontamination device according to the invention is disclosed, which is generally indicated with reference letter (D).

The decontamination device (D) for the outsoles of shoes is suitable for being disposed on the threshold of an entrance of an enclosed space.

With reference to Fig. 1, the decontamination device (D) comprises:

- a base frame (T) with a brushing station (S1), a decontamination station (S2), and a drying station (S3) disposed in adjacent position;
- a first carpet (1) disposed in correspondence of said brushing station (S1) and suitable for being walked over and rubbed by an outsole of a user's shoe in such a way to clean the shoe outsole;
- two rectangular tubs (2), namely a right-hand tub and a left-hand tub, disposed side by side in correspondence with said decontamination station (S2), which contain a sanitizing/decontamination liquid and which are suitable for respectively receiving the outsole of the user's right shoe and the outsole of the user's left shoe;
- a second carpet (3) disposed in correspondence of said drying station (S3) and suitable for being walked over and rubbed by the outsoles of the user's shoes in such a way to dry said outsoles, after sanitizing the outsoles in the decontamination station (S2).

The three stations (S1, S2, S3) are disposed side by side along an axis (X) perpendicular to the axis of higher length of the tubs.

It should be noted that, according to an alternative embodiment of the present invention, said three stations may be alternatively aligned in parallel direction to the longitudinal axis of higher length of the tubs (2).

With reference to Figs. 1A and 2, according to the preferred embodiment of the invention, the base frame (T) comprises three separate elements (10, 20, 30) that are coupled with each other, namely:

- a first element (10) with quadrangular shape that defines said brushing station (S1) and comprises four lateral edges (10a, 10b, 10c, 10d), an upper side (10s) whereon said first carpet (1) is disposed, and a lower side suitable for resting on the ground;
- a second element (20) with quadrangular shape that defines said decontamination station (S2) and comprises four lateral edges (20a, 20b,

20c, 20d), an upper side (20s) whereon the opening of the tub (2) is disposed flush, and a lower side suitable for resting on the ground;

- a third element (30) with quadrangular shape that defines said drying station (S3) and comprises four lateral edges (30a, 30b, 30c, 30d), an upper side (30s) whereon said second carpet (3) is disposed, and a lower side suitable for resting on the ground;

- first coupling means (6) for coupling a lateral edge (10c) of the first element (10) with a lateral edge (20a) of the second element (20) one against the other in adjacent position;

- second coupling means (7) for coupling a lateral edge (20c) of the second element (20) with a lateral edge (30a) of the third element (30) one against the other in adjacent position.

Said four lateral edges of each element (10, 20, 30) comprise a first lateral edge (10a, 20a, 30a), a second lateral edge (10b, 20b, 30b), a third lateral edge (10c, 20c, 30c) parallel to the first lateral edge (10a, 20, 30a), and a fourth lateral edge (10d, 20d, 30d) parallel to the second lateral edge (10b, 20b, 30b).

With reference to Figs. 1A and 2, the first coupling means (6) and the second coupling means (7) are of fit-in type.

In the preferred embodiment of the invention, the first coupling means (6) comprise two dowels (6), each one comprising a first enlarged head (60a) that is fitted inside a suitable seat that is obtained on the lower side of the first element (10) and ends in the third lateral edge (10c), and a second enlarged head (60b) that is fitted inside a suitable seat that is obtained on the lower side of the second element (20) and ends in the first lateral edge (20a).

The second coupling means (7) comprise two dowels (70), each one comprising a first enlarged head (70a) that is fitted inside a suitable seat that is obtained on the lower side of the second element (20) and that ends in the third lateral edge (20c), and a second enlarged head (70b) that is fitted inside a suitable seat that is obtained on the lower side of the third element (30) and that ends in the first lateral edge (30a).

Advantageously, said first element (10), said second element (20) and said third element (30) substantially have the same dimensions in order to be stacked one on top of the other during storage and/or transportation.

With reference to Fig. 2, for each tub (2), the decontamination device (D) comprises:

- a flat spongy body (2a) that is disposed inside the tub (2) and is suitable for being impregnated with the sanitizing/decontamination liquid; and
- a perforated grille (2b) disposed above said spongy body (2a), in such a way that when the user walks over grille (2b), the grille (2b) is lowered because of the user's weight and compresses the spongy body (2a), which consequently releases a portion of the liquid contained in the spongy body (2a), thus wetting the outsole of the shoe.

Each tub (2) is arranged inside a corresponding through opening (a) that is obtained on the decontamination station (S2), namely on the second element (20).

The brushing station (S1), that is to say the first element (10), is provided in correspondence of its upper face (10s) with a lowered seat (4) that is defined by a bottom (40) and by four perimeter walls. The first carpet (1) is housed in the lowered seat (4).

The drying station (S3), that is to say the third element (30), is provided in correspondence of its upper face (30s) with a lowered seat (5) that is defined by a bottom (50) and by four perimeter walls. The second carpet (3) is housed in the lowered seat (5).

The carpets (1, 3) consist of conventional carpets that can be easily found on the market, each one comprising a support sheet or weft and yarns or fibers sewn or attached to said support sheet or weft that protrude in upper position from said support sheet or weft.

Said yarns or fibers may be made of different materials and may be made of silk, cotton, vegetable fibers, synthetic fibers, etc....

Preferably, each station (S1, S2, S3) of the frame is provided with engravings or texts that define the action to be performed on each station. By way of example, the brushing station (S1) is provided with the text “brush”, whereas the decontamination station (S2) is provided with the text “decontamination” or “sanitization”, and whereas the drying station (S3) is provided with the text “dry”.

Moreover, although Fig. 2 shows a preferred embodiment of the invention, wherein the base frame (T) is composed of three elements (10, 20, 30) that are coupled together, the main objectives pursued by the present

invention can be also achieved with a monolithic base frame (T). Evidently, in such a case, the aforementioned advantages of storage and transportation, which are obtained precisely from the modularity of the base frame (T), would be lost.

With reference to Figs. 3, 4 and 5, this description continues by illustrating the way in which the decontamination device (D) according to the invention should be used.

With reference to Fig. 3, firstly, the user stands on the brushing station (S1) and rubs the outsoles of both shoes on the first carpet (1) in such a way that dirt, dust, and organic substances are released on the first carpet (1).

With reference to Fig. 4, after cleaning and brushing the outsoles, the user stands on the decontamination station (S2), placing his/her feet inside the two tubs, resting the outsoles on the grilles (2c).

The weight of the user tends to push the grids (2b) down; the grids (2b) compress the sponge body (2a) that releases the sanitizing/decontamination liquid on the outsoles, sanitizing and decontaminating them.

Now, with reference to Fig. 5, the user stands on the drying station (S3) where, by rubbing the outsoles of the shoes, the excess liquid is absorbed in such a way that the outsoles can get dry without the need for unhygienic manual actions.

When the drying is completed, the user step down from the decontamination device (D) and pass through the entrance of the enclosed space with sanitized, decontaminated and dry shoes.

As a result of the above description, the idea that allows the present invention to achieve its objectives is evident.

As a matter of fact, because of the provision of the three stations (S1, S2, S3) disposed side by side and arranged on the base frame (T), a user can easily:

- brush the outsoles of his/her shoes in such a way as to carry out a general cleaning of the outsoles, removing dirt, organic debris and the like;
- sanitize accurately the outsoles of the shoes in such a way as to avoid the introduction of viruses, bacteria and pathogens inside an enclosed space (house, office, hospital and the like);
- dry the outsole suitably, after the sanitization, in such a way that the outsole is dry, reducing the risk of slipping and falling.

Moreover, the operation of the carpet is simple and intuitive because of the engravings or texts provided on the frame to indicate the type of action to be performed on each station.

Numerous variations and modifications may be made to the present embodiment of the invention, which are within the scope of a person skilled in the art, and in any case fall within the scope of the invention as expressed by the appended claims.

By way of example, instead of having the quadrangular shape shown in the figures, the carpets (1, 3) may have any other shape, such as a circular or oval shape. It goes without saying that the lowered seats (4, 5) will have the same shape as the carpets (1, 3) in such a way that each carpet can be disposed firmly in place in its lowered seat (4, 5).

CLAIMS

1) Decontamination device (D) for footwear outsoles suitable for being disposed in the threshold of an entrance of an enclosed place; said decontamination device (D) comprising:

- a base frame (T) provided with a brushing station (S1), a decontamination station (S2), and a drying station (S3) disposed side by side;
- a first carpet (1) disposed in correspondence of said brushing station (S1) and suitable for being walked over and rubbed by an outsole of a user's shoe in such a way to clean the shoe outsole;
- at least one tub (2) disposed in correspondence of said decontamination station (S2) that contains a sanitizing/decontamination liquid and wherein the outsole of the user's shoe is suitable for being inserted;
- a second carpet (3) disposed in correspondence of said drying station (S3) and suitable for being walked over and rubbed by the outsole of the user's shoe in such a way to dry said outsole.

characterized in that it comprises:

- a flat spongy body (2a) disposed inside said at least one tub (2) and suitable for being impregnated with the sanitizing/decontamination liquid; and
- a perforated grille (2b) disposed above said spongy body (2a), in such a way that when the user walks over grille (2b), the grille (2b) is lowered because of the user's weight and compresses the spongy body (2a) that partially releases the sanitizing/decontamination liquid contained in the spongy body (2a), wetting the outsole of the shoe.

2) The decontamination device (D) of claim 1, wherein said base frame (T) comprises at least one opening (a) in correspondence of said decontamination station, wherein said at least one tub (2) is housed.

3) The decontamination device (D) of claim 1 or 2, comprising two tubs (2) in adjacent position, namely a left-hand tub (2) and a right-hand tub (2).

4) The decontamination device (D) of any one of the preceding claims, wherein said base frame (T) comprises a lowered housing (4) disposed in correspondence of the brushing station (S1) wherein said first carpet (1) is housed.

5) The decontamination device (D) of any one of the preceding claims, wherein said base frame (T) comprises a lowered housing (5) disposed

in correspondence of the brushing station (S1) wherein said second carpet (3) is housed.

6) The decontamination device (D) of any one of the preceding claims, comprising three separate elements (10, 20, 30) that can be mutually coupled, namely:

- a first element (10) with quadrangular shape that defines said brushing station (S1) and comprises four lateral edges (10a, 10b, 10c, 10d), an upper side (10s) whereon said first carpet (1) is disposed, and a lower side suitable for resting on the ground;
- a second element (20) with a substantially quadrangular shape that defines said decontamination station (S2) and comprises four lateral edges (20a, 20b, 20c, 20d), an upper side (20s) whereon the opening of the tub (2) is disposed flush, and a lower side suitable for resting on the ground;
- a third element (30) with quadrangular shape that defines said drying station (S3) and comprises four lateral edges (30a, 30b, 30c, 30d), an upper side (30s) whereon said second carpet (3) is disposed, and a lower side suitable for resting on the ground;
- first coupling means (6) for coupling a lateral edge (10c) of the first element (10) to a lateral edge (20a) of the second element (20) one against the other in adjacent position;
- second coupling means (7) for coupling a lateral edge (20c) of the second element (20) to a lateral edge (30a) of the third element (30) one against the other in adjacent position;

7) The decontamination device (D) of claim 6, wherein said first coupling means (6) and said second coupling means (7) are of fit-in type.

8) The decontamination device (D) of claim 7, wherein said first coupling means (6) comprise at least one piece (60) comprising:

- a first enlarged head (60a) that is fitted in a seat suitably provided on the lower side of the first element (10) and ends in one of said lateral edges (10c) of the first element (10), and
- a second enlarged head (60b) that is fitted in a seat suitably provided on the lower side of the second element (20) and ends in one of said lateral edges (20a) of the second element (20);

wherein said second coupling means (7) comprise at least one piece (70) comprising:

- a first enlarged head (70a) that is fitted in a seat suitably provided on the lower side of the second element (20) and ends in one of said lateral edges (20c) of the second element (20), and

- a second enlarged head (70b) that is fitted in a seat suitably provided on the lower side of the third element (30) and ends in the lateral edge (30a) of the third element (30).

9) The decontamination device (D) of claim 6 or 7 or 8, wherein said first element (10), said second element (20) and said third element (30) have the same dimensions in order to be stacked other during storage and/or transportation.

10) The decontamination device (D) of any one of the preceding claims, wherein each carpet (1, 3) comprises a support sheet and yarns or fibers sewn or fixed to said support sheet and protrude in upper position from said support sheet.

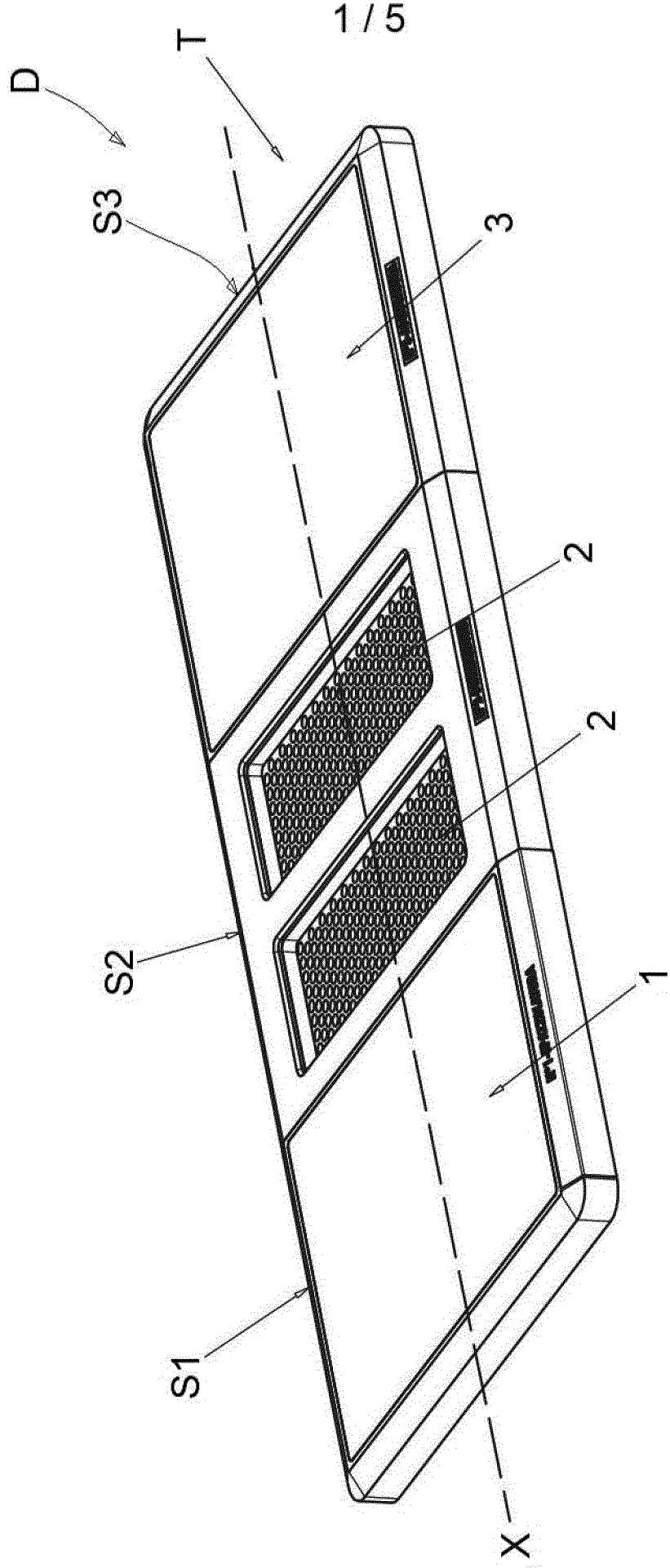

FIG. 1

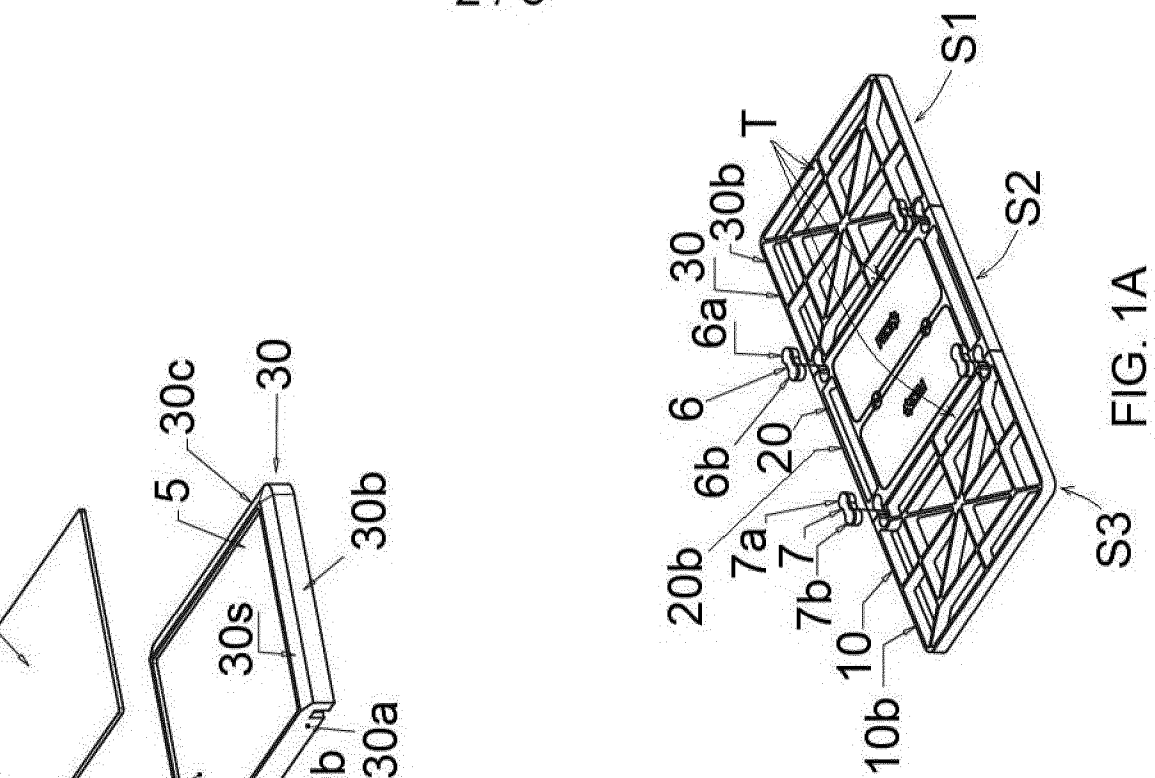
S1
T
30b
30
S2
6a
6
6b
20
20b
7a
7
7b
10
10b
S3

FIG. 1A

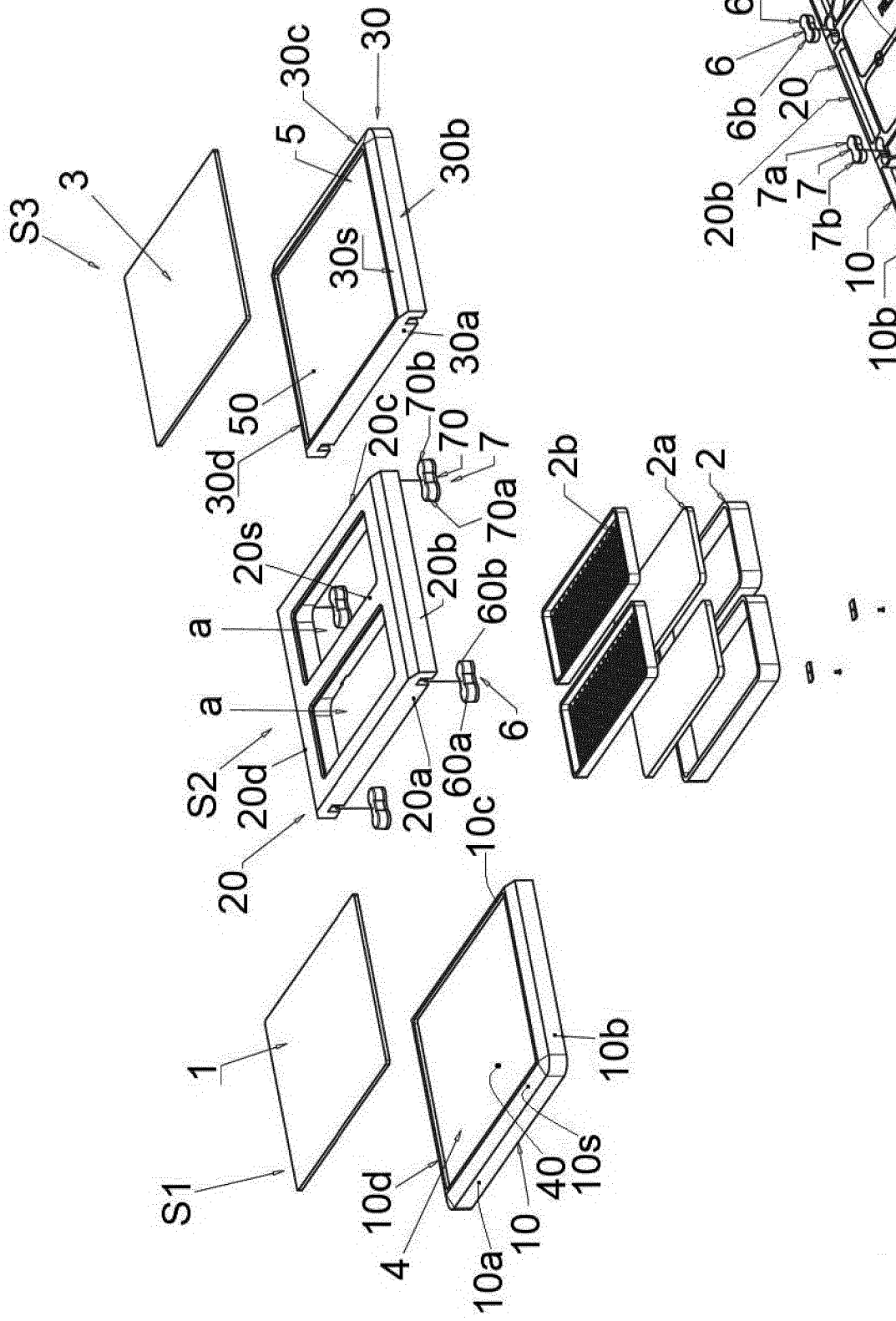
S3
3
5
30c
30
30b
30s
30a
50
30d
70b
70
7
70a
20c
20s
20b
a
60b
a
6
S2
20d
60a
20a
10c
20
2b
2a
2
1
S1
10d
4
10a
10
40
10s
10b

FIG. 2

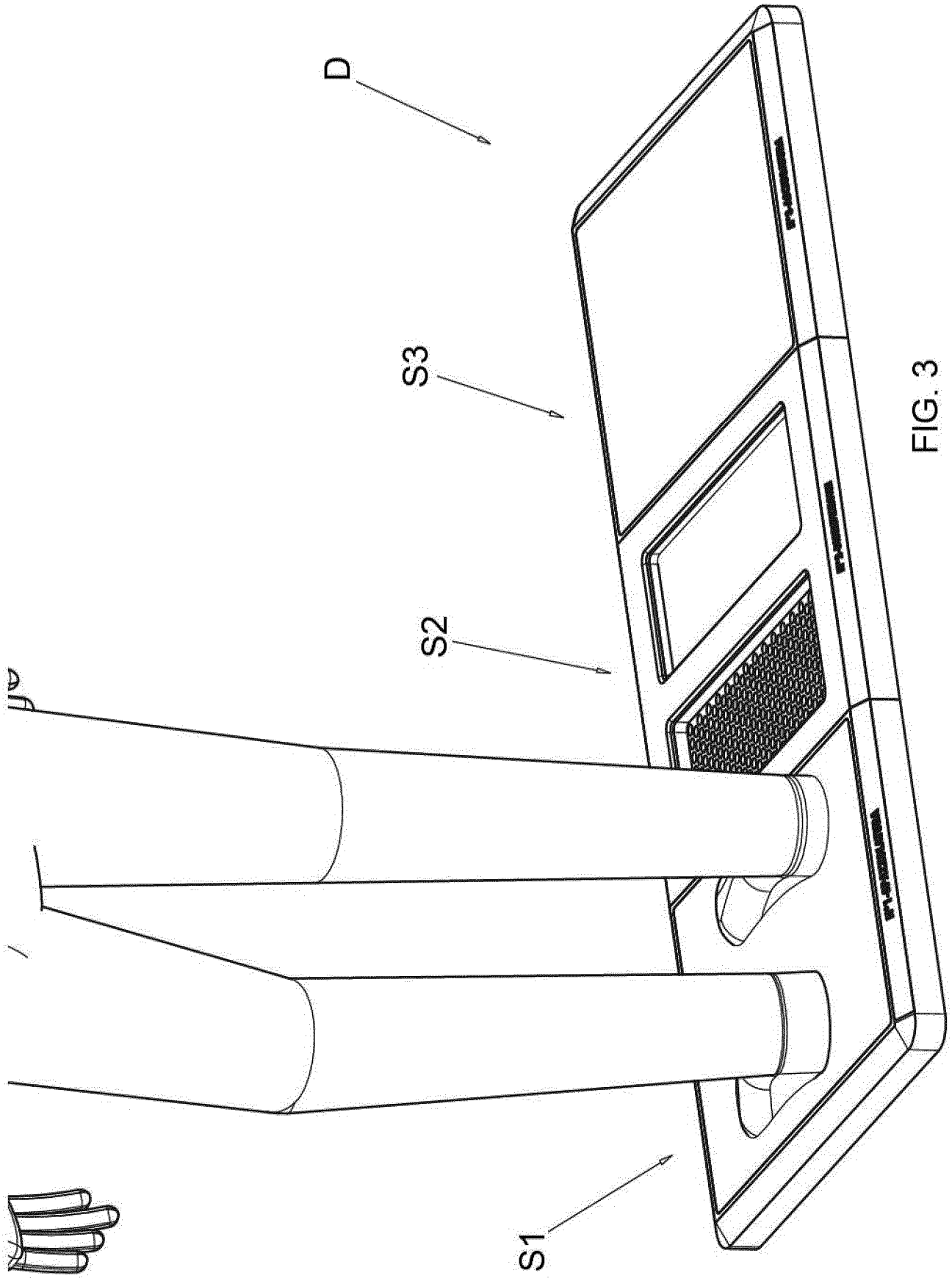

FIG. 3

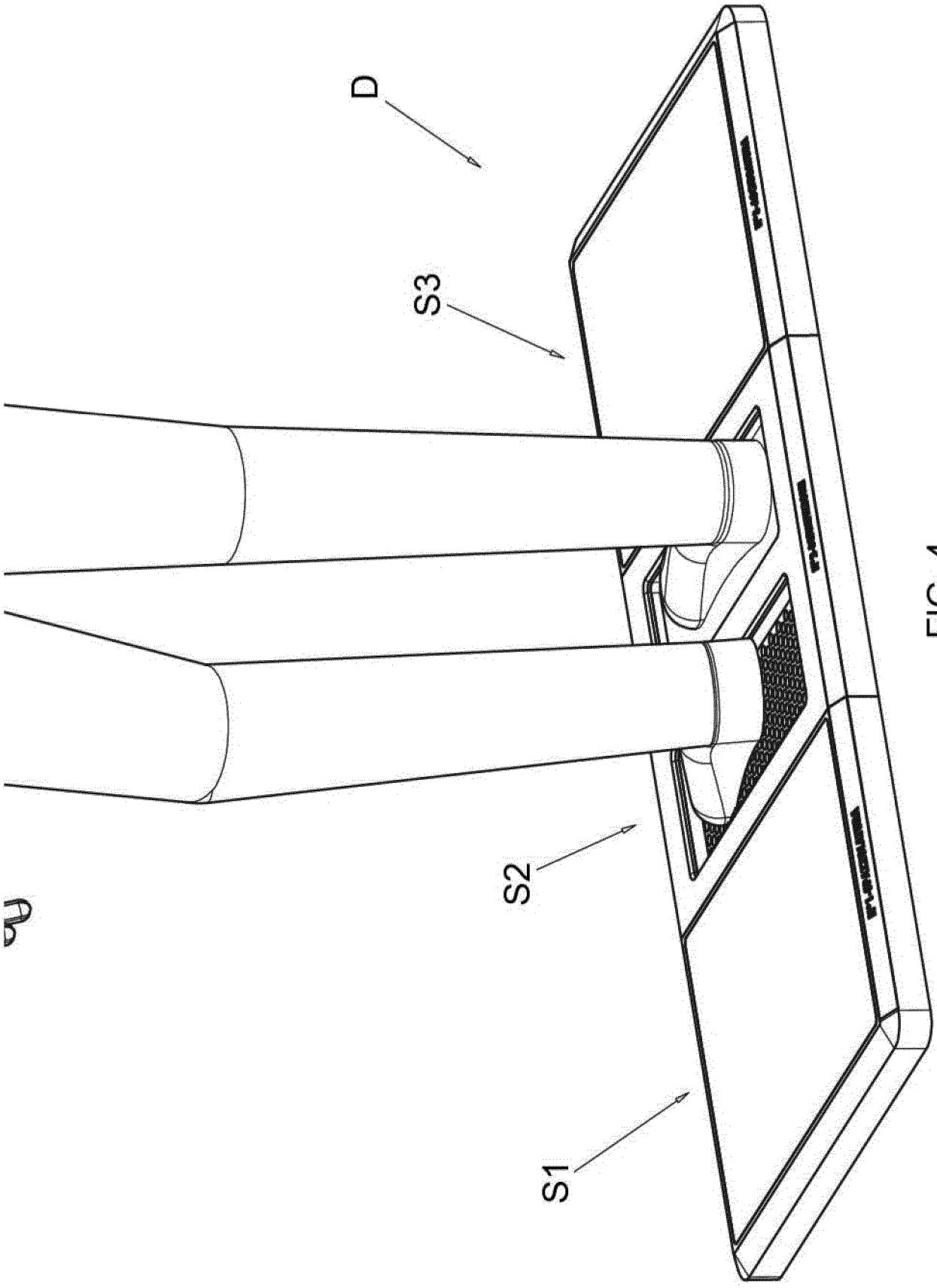

FIG. 4

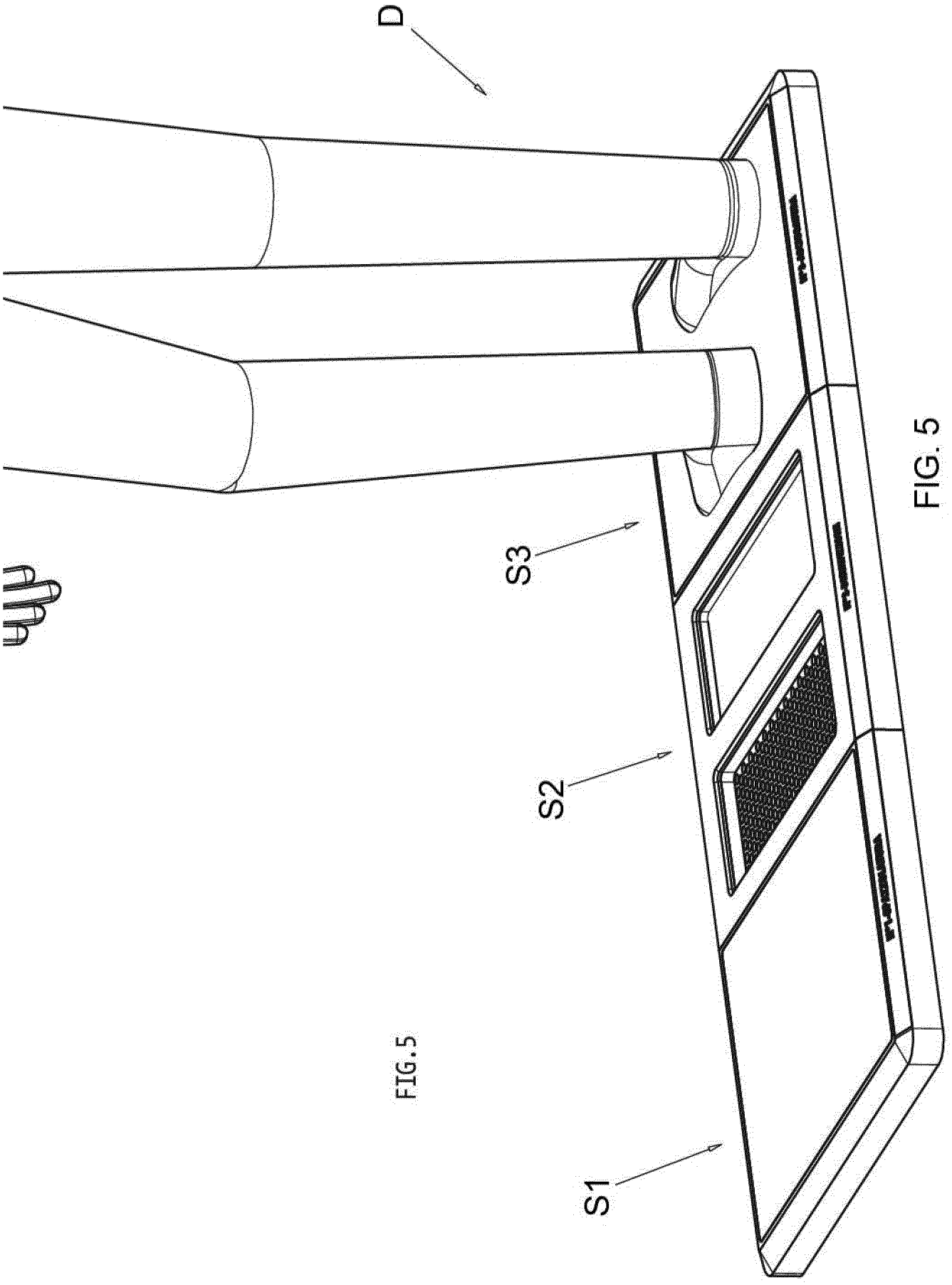

FIG. 5

FIG.5

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2021/074180

A. CLASSIFICATION OF SUBJECT MATTER
INV. A47L23/26
ADD.

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)
A47L

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)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 20 2020 102441 U1 (FELDMANN MARTIN [DE]; MIJATOVIC TOMISLAV [DE]) 8 May 2020 (2020-05-08) paragraph [0027] - paragraph [0032]; figures 1,2	1-10
A	CN 108 720 791 A (CHONGQING JIEBANG ELECTRICAL APPLIANCE CO LTD) 2 November 2018 (2018-11-02) abstract; figure 1	1-10
A	US 5 996 160 A (PRUITT DAVID D [US]) 7 December 1999 (1999-12-07) column 2, line 26 - column 3, line 35; figures 1,2	1-10

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"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)

"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

"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

"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

"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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
19 October 2021	09/11/2021

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Blumenberg, Claus

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2021/074180

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 202020102441 U1	08-05-2020	NONE	
CN 108720791 A	02-11-2018	NONE	
US 5996160 A	07-12-1999	NONE	