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(54) **SNOW TOOL**

(57) A snow tool (1, 26) comprises a scoop (2) comprising at least a rear wall (2d), and a reinforcement element (7) attachable to the rear wall (2d) of the scoop (2).

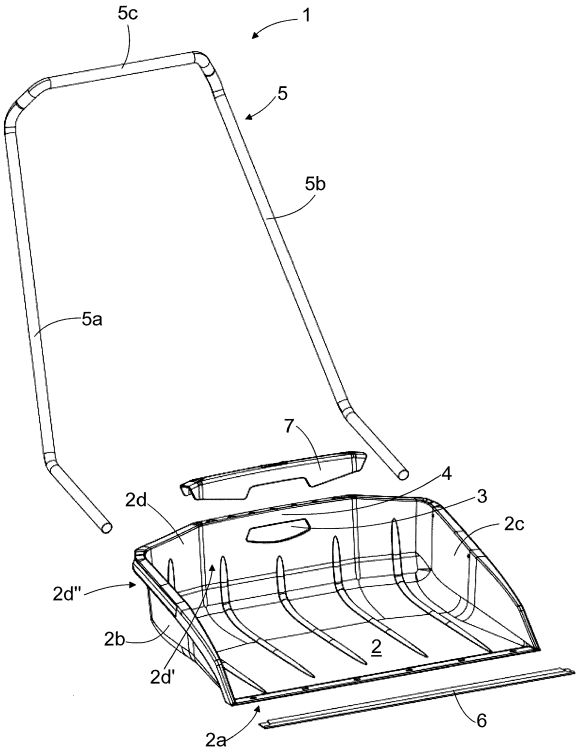

FIG. 1

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Description

FIELD OF THE INVENTION

[0001] The invention relates to a snow tool.

BACKGROUND OF THE INVENTION

[0002] Snow tools, such as snow pushers, snow shovels or pusher shovels, are used to remove snow from pavements or driveways, for example. Snow tools typically comprise a scoop which comprises a rear wall as well as sidewalls and which is made of plastic or some other material with substantially thin wall thickness.

[0003] When the snow tool is used, the user of the snow tool may often support or kick his/her leg against the rear wall of the scoop of the snow tool for boosting a penetration of the scoop into snow. This, however, may cause a bend or a breakage of the scoop.

[0004] In a solution to reinforce a structure of the scoop in a snow pusher a steel pipe has been arranged at a top end of the rear wall and the side walls of the scoop to support the structure of the scoop. A disadvantage of this solution is an increased weight of the snow pusher due to the weight of the steel pipe, as well as extra working phases to attach the steel pipe to the snow pusher in the manufacturing of the snow pusher. In another solution to reinforce the structure of the scoop a honeycomp structure has been implemented inside the plastic structure of the scoop. The honeycomp structure, however, may not be strong enough to endure if the user of the snow pusher supports or kicks his/her leg heavily against the rear wall of the scoop of the snow pusher.

BRIEF DESCRIPTION OF THE INVENTION

[0005] An object of the present invention is to provide a novel snow tool.

[0006] The invention is characterized by the features of the independent claim.

[0007] Snow tool comprises a scoop having at least a rear wall, and a reinforcement element attachable to the rear wall of the scoop.

[0008] The reinforcement element attachable to the rear wall of the scoop provide, together with the rear wall of the scoop, such a strength structure that a user of the snow tool may support or kick his/her leg also heavily against the reinforcement element of the scoop of the snow tool for boosting a penetration of the scoop into snow without a risk of the scoop to damage.

[0009] Some embodiments of the invention are disclosed in the dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] In the following the invention will be described in greater detail by means of preferred embodiments with reference to the accompanying drawings, in which

Figure 1 shows schematically a snow pusher in parts;
Figure 2 shows schematically the snow pusher of Figure 1 as assembled;
Figure 3 shows schematically a lower view of a section of a scoop of the snow pusher;
Figure 4 shows schematically an upper view of a rear wall of the scoop of the snow pusher;
Figure 5 shows schematically a reinforcement element;
Figure 6 shows schematically the reinforcement element of Figure 5 as turned upside down;
Figures 7 and 8 show schematically the reinforcement element as attached to the scoop;
Figure 9 shows schematically a pusher shovel and a reinforcement element to be attached to the pusher shovel; and
Figure 10 shows schematically the pusher shovel of Figure 9 with the reinforcement element being attached to the pusher shovel.

[0011] For the sake of clarity, the figures show some embodiments of the invention in a simplified manner. Like reference numerals identify like elements in the figures.

DETAILED DESCRIPTION OF THE INVENTION

[0012] Figure 1 shows schematically a snow pusher 1 in parts. An alternative nomination for the snow pusher 1 may be a sleigh shovel. Figure 2 shows schematically the snow pusher 1 of Figure 1 as assembled. The snow pusher 1 comprises a scoop 2 having a front end 2a, a first side wall 2b, a second side wall 2c and a rear wall 2d with a front surface 2d' facing towards the front end 2a of the scoop 2 and a rear surface 2d" facing away from the scoop 2. In the rear wall 2d of the scoop 2 there is an opening 3 for providing a hand grip 4 for carrying the snow pusher 1. The snow pusher 1 further comprises a push bar 5 to be attached to the side walls 2b, 2c of the scoop 2, the push bar 5 comprising two upwards projecting push bar portions 5a, 5b to be attached to the side walls 2b, 2c of the scoop 2, for example, and a substantially horizontal push bar portion 5c connecting the two upwards projecting push bar portions 5a, 5b together. The snow pusher 1 may also comprise a wear strip 6 to be attached to the front end 2a of the scoop 2 for reinforcing a structure of the front end 2a of the scoop 2. Further the snow pusher comprises a reinforcement element 7 to be attached to the rear wall 2d of the scoop 2 for reinforcing a structure of the rear wall 2d of the scoop 2.

[0013] Figure 3 shows schematically a lower view of a section of the scoop 2 of the snow pusher 1 and Figure 4 shows schematically an upper view of the rear wall 2d of the scoop 2 of the snow pusher 1. The rear wall 2d of the scoop 2 comprises an upper edge 8, which is bent outwards from the scoop 2. Next to the side walls 2b, 2c the upper edge 8 of the rear wall 2d of the scoop 2 com-

prises downwards opening side portions 8a, 8b including a support structure that is arranged between the upper edge 8 and the rear wall 2d of the scoop 2, the support structure substantially remaining in a space limited by the downward bent upper edge 8 and the rear wall 2d of the scoop 2. The intention of that support structure is to reinforce a structure of the rear wall 2d of the scoop 2 at the side portions 8a, 8b of the upper edge 8 of the rear wall 2d of the scoop 2. The side walls 2b, 2c of the scoop 2 comprise also, next to the front end 2a of the scoop 2, from the scoop 2 outwards bent upper edges that open downwards and include support structures that substantially remain in spaces limited by the downward bent upper edges of the side walls 2b, 2c and the side walls 2b, 2c for reinforcing a structure of the side walls 2b, 2c of the scoop 2. In the embodiment disclosed in the Figures, the support structures mentioned above are implemented in a form of a support ribbing that opens downwards, but the support structures could also be realized with other suitable structures too.

[0014] The upper edge 8 of the rear wall 2d of the scoop 2 comprises also, between the side portions 8a, 8b, a middle portion 8c that, as said, remains between the side portions 8a, 8b and is open upwards. The middle portion 8c of the upper edge 8 of the rear wall 2d of the scoop 2 forms a receiving portion of the rear wall 2d of the scoop 2 for receiving and attaching the reinforcement element 7 with the rear wall 2d of the scoop 2. Therefore the middle portion 8c of the upper edge 8 of the rear wall 2d of the scoop 2 may also be called the receiving portion 8c which is arranged to the upper part of the rear wall 2d of the scoop 2 between the two upwards projecting push bar portions 5a, 5b. Alternatively to the embodiment shown in the Figures the receiving portion may extend close to the side walls 2b, 2c of the scoop 2 or up to the side walls 2b, 2c of the scoop 2, whereby the side portions 8a, 8b of the upper edge 8 of the rear wall 2d are shorter than those shown in the Figures or there may be no specific side portions 8a, 8b at all.

[0015] The receiving portion 8c has a front wall 9 being formed of the rear wall 2d of the scoop 2 and a rear wall 10 being formed of a downwards pointing flange of the upper edge 8 of the rear wall 2d. The front wall 9 and the rear wall 10 of the receiving portion 8c contribute to define a space of the receiving portion 8c that is configured to receive and attach the reinforcement element 7 to be attached to the scoop 2. The front wall 9 comprises an inner surface facing away from the scoop 2 and the rear wall 10 comprises an inner surface facing towards the scoop 2.

[0016] The receiving portion 8c further comprises a support ribbing 11 being formed of support ribs 12 arranged to run or travel along a zig-zag path between the front wall 9 and the rear wall 10 of the receiving portion 8c in such a way that two neighbouring support ribs 12 and a portion of the front wall 9 or a portion of the rear wall 10 together form a support element 13 having a shape of a triangular.

[0017] The receiving portion 8c further comprises, on the inner surface of the rear wall 10, snap fit fasteners 14 that project towards the front wall 9 of the receiving portion 8c, i.e. towards the space arranged to receive the reinforcement element 7, for attaching the reinforcement element 7 into place substantially immobile, as discussed in more detail later. Similar snap fit fasteners 14 projecting towards the rear wall 10 may also be arranged to the inner surface of the front wall 9 too.

[0018] Figure 5 shows schematically a reinforcement element 7 and Figure 6 shows schematically the reinforcement element 7 as turned upside down. The reinforcement element 7 comprises a substantially vertical front flange 15 an outer surface of which is to be directed towards the front end 2a of the scoop 2, and a substantially vertical rear flange 16 an outer surface of which is to be directed away from the rear wall 2d of the scoop 2. Further the reinforcement element 7 comprises a substantially horizontal upper flange 17 between the front flange 15 and the rear flange 16, the upper flange 17 thus connecting the front flange 15 and the rear flange 16 together such that there remains a distance between an inner surface of the front flange 15 and an inner surface of the rear flange 16.

[0019] The reinforcement element 7 further comprises a support ribbing 18 that is seated at an inner surface of the upper flange 17, the support ribbing 18 pointing downwards when the reinforcement element 7 is attached to the scoop 2. The support ribbing 18 is formed of support ribs 19 that point downwards when the reinforcement element 7 is attached to the scoop 2. The support ribs 19 are arranged into groups of three support ribs 19 in such a way that the support ribs 19 in one group of three support ribs 19 are arranged to form a support element 20 having a shape of a triangular, whereby a number of adjacent groups of three support ribs 19 are arranged to form a number of neighbouring support elements 20 each having a shape of a triangular.

[0020] The support elements 20 are arranged at a distance from each other and at a distance both from the front flange 15 and the rear flange 16. In other words, there are narrow spaces 21 between the neighbouring support elements 20 so as to receive the ribs 12 of the support elements 13 in the receiving portion 8c of the scoop 2, and narrow spaces 22 between the support elements 20 and the front flange 15 so as to receive the front wall 9 of the receiving portion 8c of the scoop 2 and narrow spaces 23 between the support elements 20 and the rear flange 16 so as to receive the rear wall 10 of the receiving portion 8c of the scoop 2, when the reinforcement element 7 is attached into place to the scoop 2.

[0021] In the reinforcement element 7 the ribs 19 that are parallel to the front flange 15 or the rear flange 16 comprise openings 24 so as to receive the snap fit fasteners 14 remaining in the receiving portion 8c of the scoop 2, the openings 24 thus forming a kind of counterparts for the snap fit fasteners 14.

[0022] In the front flange 15 of the reinforcement ele-

ment 7 there is also a recess 25 opening downwards. The recess 25 has the effect that the font flange 15 of the reinforcement element 7 does not cover the opening 3 in the rear wall 2d of the scoop 2, which opening 3 is arranged to provide the hand grip 4 of the snow pusher 1.

[0023] Figure 7 shows schematically the reinforcement element 7 as attached to the receiving portion 8c of the scoop 2, when the upper flange 17 of the reinforcement element 7 is removed from Figure 7. Figure 8 is a cross-sectional end view of the receiving portion 8c and the reinforcement element 7 when the reinforcement element 7 is attached to the receiving portion 8c.

[0024] As can be seen from Figures 7 and 8, the support elements 13 in the receiving portion 8c intermesh with the support elements 20 in the reinforcement element 7 in such a way that the ribs 12 of the support elements 13 in the receiving portion 8c penetrate into spaces 21 between the neighbouring support elements 20 in the reinforcement element 7 when the reinforcement element 7 is attached to the scoop 2. Similarly, the front wall 9 of the receiving portion 8c penetrates into the spaces 22 between the support elements 20 and the front flange 15 in the reinforcement element 7 and the rear wall 10 of the receiving portion 8c penetrates into the spaces 23 between the support elements 20 and the rear flange 16 in the reinforcement element 7, when the reinforcement element 7 is attached to the scoop 2. In the embodiment disclosed the support elements 13 in the receiving portion 8c are thus arranged to surround the support elements 20 in the reinforcement element 7.

[0025] From Figure 8 it can further be seen how the snap fit fasteners 14 in the receiving portion 8c penetrate into the openings 24 in the ribs 19 of the reinforcement element 7 that are parallel to the front flange 15 or the rear flange 16 of the reinforcement element 7, thus attaching the reinforcement element 7 substantially immobile to the receiving portion 8c in the scoop 2. The snap fit fasteners 14 may be left out if a compressive force high enough affects between the receiving portion 8c and the reinforcement element 7 to keep the reinforcement element in place when the reinforcement element 7 is attached to the scoop 2.

[0026] From Figure 7, for example, it can be seen that the embodiment disclosed provides a threefold support between the scoop 2 and the reinforcement element 7. A first support is formed between the rear flange 16 of the reinforcement element 7, the rib 19 of the support element 20 of the reinforcement element 7 which rib 19 is parallel to the rear flange 16 of the reinforcement element 7 and the rear wall 9 of the receiving portion 8c remaining therebetween. A second support is formed between the neighbouring support elements 20 in the reinforcement element 7 and the rib 12 of the support element 13 of the receiving portion 8c remaining therebetween. A third support is formed between the front flange 15 of the reinforcement element 7, the rib 19 of the support element 20 of the reinforcement element 7 which rib 19 is parallel to the front flange 15 of the reinforcement element 7 and the front wall 9 of the receiving portion 8c remaining therebetween. The receiving portion 8c and the reinforcement element 7 together provide so strength structure that a user of the snow pusher 1 may support or kick his/her leg heavily against the reinforcement element 7 of the scoop 2 of the snow pusher 1 for boosting a penetration of the scoop 2 into snow without any risk of the scoop 2 to damage.

[0027] In the embodiment disclosed above, inner and outer surfaces of the front wall 9 and the rear wall 10 in the receiving portion 8c and inner surfaces of the front flange 15 and the rear flange 16 in the reinforcement element 7 as well as side surfaces of the ribs 12, 19 in the receiving portion 8c and the reinforcement element 7 form support surfaces that set against each other in a predefined manner. These support surfaces provide large surface areas for dividing a pressure originating from pushing or kicking the reinforcement element 7 with the leg into a large area in the mutual support of the receiving portion 8c and the reinforcement element 7, thus effectively attenuating forces encountered by the scoop 2 due to pushing or kicking the reinforcement element 7 with the leg.

[0028] In the embodiment shown the support elements 13, 20 in the receiving portion 8c and in the reinforcement element 7 are shaped as triangular. However, the support elements 13, 20 in the receiving portion 8c and in the reinforcement element 7 may be shaped in many different manners so that the ribs 12, 19 of them are able to intermesh with each other in order to provide a strong structure when the reinforcement element 7 is attached to the scoop 2. In other words, receiving portion 8c and the reinforcement element 7 may be realized in many different ways so that the receiving portion 8c in the rear wall 2d of the scoop 2 comprises at least one support surface and the reinforcement element 7 comprises at least one support surface which provides a counterpart for the support surface in the rear wall 2d of the scoop 2, and that the support surface in the rear wall 2d of the scoop 2 and the support surface in the reinforcement element 7 are arranged to set against each other when the reinforcement element 7 is attached to the scoop 2.

[0029] Figure 9 shows schematically a pusher shovel 26 and a reinforcement element 7 to be attached to the pusher shovel 26, and Figure 10 shows schematically the pusher shovel 26 of Figure 9 with the reinforcement element 7 being attached to the pusher shovel 26.

[0030] The pusher shovel 26 comprises a scoop 2 having a front end 2a, a first side wall 2b, a second side wall 2c and a rear wall 2d with a front surface 2d' and a rear surface 2d". The pusher shovel 26 further comprises a shaft 27 attached to the scoop 2 and extending away from the scoop 2. The pusher shovel 26 may also comprise a wear strip 6 to be attached to the front end 2a of the scoop 2 for reinforcing a structure of the front end 2a of the scoop 2. Further the pusher shovel 26 comprises a reinforcement element 7 to be attached to the rear wall 2d of the scoop 2 for reinforcing a structure of the rear

wall 2d of the scoop 2.

[0031] The reinforcement element 7 comprises a substantially vertical front flange 15, a substantially vertical rear flange 16 and an upper flange 17 connecting the front flange 15 and the rear flange 16 to each other such that there is a distance between an inner surface of the front flange 15 and an inner surface of the rear flange 16. The reinforcement element 7 is attached to an upper part of the scoop 2 of the pusher shovel 26, and to be more exact, to an upper edge 8 of the rear wall 2d of the scoop 2 providing a kind of a receiving portion 8c for the reinforcement element 7, in such a way that the inner surface of the front flange 15 of the reinforcement element 7 settles against the front surface 2d' of the rear wall 2d of the scoop 2 and the inner surface of the rear flange 16 of the reinforcement element 7 settles against the rear surface 2d" of the rear wall 2d of the scoop 2. A shape of the upper flange 17 and shapes of the front flange 15 and the rear flange 16 as well as the distance between the inner surface of the front flange 15 and the inner surface of the rear flange 16 is realized in such a way that there will be a compression force between the inner surface of the front flange 15 of the reinforcement element 7 and the front surface 2d' of the rear wall 2d of the scoop 2 as well as between the inner surface of the rear flange 16 of the reinforcement element 7 and the rear surface 2d" of the rear wall 2d of the scoop 2 for retaining the reinforcement element in place at the rear wall 2d of the scoop 2.

[0032] In the embodiment of Figures 9 and 10 the rear wall 2d of the scoop 2 and the reinforcement element 7 together provide so strength structure that a user of the pusher shovel 26 may support or kick his/her leg against the reinforcement element 7 of the scoop 2 of the pusher shovel 26 for boosting a penetration of the scoop 2 into snow without a risk of the scoop 2 to damage.

[0033] According to an embodiment the front 2d' and the rear 2d"surfaces of the rear wall 2d of the scoop 2 may comprise snap fit fasteners 14 projecting away from the respective surfaces 2d', 2d", and the inner surfaces of the front flange 15 and the rear flange 16 comprise openings 24 for providing counterparts for the snap fit fasteners 14 so as to receive the snap fit fasteners 14 in order to attach the reinforcement element 7 to the scoop 2. In that case there is no immediate need for any compression forces remaining between the rear wall 2d of the scoop 2 and the reinforcement element 7.

[0034] According to an embodiment, the reinforcement solution disclosed in Figures 9 and 10 may be applied in a snow shovel or a snow pusher too.

[0035] According to an embodiment, the reinforcement solution disclosed in Figures 1 to 8 may be applied in a snow shovel or a pusher shovel too.

[0036] The scoop and the reinforcement element are preferably both made of plastic so as to keep a weight of the snow tool as small as possible. The snow tool comprising the scoop 2 and the reinforcement element 7 are manufactured separately and the reinforcement element 7 is attached to the scoop 2 before any use of the snow tool or the reinforcement element 7 may be purchased and attached to the scoop 2 at a later stage too.

[0037] Alternative colours may be used in the scoops and in the reinforcement elements in order to provide varying appearance of the snow tool what comes to the colour of the snow tool. The reinforcement elements 7 may also be furnished with different logos, such as with a logo of the manufacturer or a retailer of the snow tool. An external appearance or a shape of the reinforcement element 7 may also deviate from that shown in the Figures.

[0038] It will be obvious to a person skilled in the art that, as the technology advances, the inventive concept can be implemented in various ways. The invention and its embodiments are not limited to the examples described above but may vary within the scope of the claims.

Claims

1. A snow tool (1, 26) comprising
a scoop (2) comprising at least a rear wall (2d), and
a reinforcement element (7) attachable to the rear wall (2d) of the scoop (2).

2. A snow tool as claimed in claim 1, **characterized in that** the reinforcement element (7) is attachable to an upper part of the rear wall (2d) of the scoop (2).

3. A snow tool as claimed in claim 1 or 2, **characterized in that** an upper part of the rear wall (2d) of the scoop (2) comprises at least one receiving portion (8c) to receive and attach the reinforcement element (7) to the scoop (2).

4. A snow tool as claimed in any one of the preceding claims, **characterized in that** the reinforcement element (7) comprises a front flange (15) settling against a front surface (2d') of an upper part of a rear wall (2d) of the scoop (2) and a rear flange (16) settling against a rear surface (2d") of the upper part of the rear wall (2d) of the scoop (2).

5. A snow tool as claimed in any one of the preceding claims, **characterized in that** an upper part of the rear wall (2d) of the scoop (2) comprises an upper edge (8) bent away from the scoop (2) and that the upper edge (8) comprises at least one receiving portion (8c) to receive and attach the reinforcement element (7) to the scoop (2).

6. A snow tool as claimed in any one of the preceding claims, **characterized in that** the rear wall (2d) of the scoop (2) comprises at least one support surface and the reinforcement element (7) comprises at least one support surface which provides a counterpart

for the support surface in the rear wall of the scoop, and that the support surface in the rear wall (2d) of the scoop (2) and the support surface in the reinforcement element (7) are arranged to settle against each other when the reinforcement element (7) is attached to the scoop (2).

7. A snow tool as claimed in any one of claims 3 to 6, **characterized in that** the receiving portion (8c) comprises a support ribbing (11) and that the reinforcement element (7) comprises a support ribbing (18) that provides a counterpart for the support ribbing (11) in the receiving portion (8c), and that the support ribbing (18) in the reinforcement element (7) is configured to intermesh with the support ribbing (11) in the receiving portion (8c) when the reinforcement element (7) is attached to the scoop (2).

8. A snow tool as claimed in claim 7, **characterized in that** the support ribbing (11) in the receiving portion (8c) and the support ribbing (18) in the reinforcement element (7) are configured to form shaped support elements (13, 20) that are arranged to intermesh with each other when the reinforcement element (7) is attached to the scoop (2).

9. A snow tool as claimed in claim 8, **characterized in that** the support element (13) in the receiving portion (8c) is arranged to at least partly surround the support element (20) in the reinforcement element (7) when the reinforcement element (7) is attached to the scoop (2).

10. A snow tool as claimed in claim 8 or 9, **characterized in that** the support elements (13) in the receiving portion (8c) and the support elements (20) in the reinforcement element (7) are triangularly shaped support elements.

11. A snow tool as claimed in any one of claims 7 to 10, **characterized in that** the support ribbing (11) in the receiving portion (8c) in the scoop (2) is embedded into the upper edge (8) of the rear wall (2d) of the scoop (2).

12. A snow tool as claimed in any one of claims 3 to 11, **characterized in that** the receiving portion (8c) comprises snap fit fasteners (14), which are arranged to project towards the reinforcement element (7) to be attached to the scoop (2), and that the reinforcement element (7) comprise counterparts arranged to receive the snap fir fasteners (14) for attaching the reinforcement element (7) to the scoop (2).

13. A snow tool as claimed in claim 12, **characterized in that** the counterparts in the reinforcement element (7) for receiving the snap fit fasteners (14) of the receiving portion (8c) are arranged in the support ribbing (19) of the reinforcement element (7).

14. A snow tool as claimed in any one of the preceding claims, **characterized in that** at least one of the scoop (2) and the reinforcement element (7) is made of plastic.

15. A snow tool as claimed in any one of the preceding claims, **characterized in that** the snow tool is a snow pusher (1).

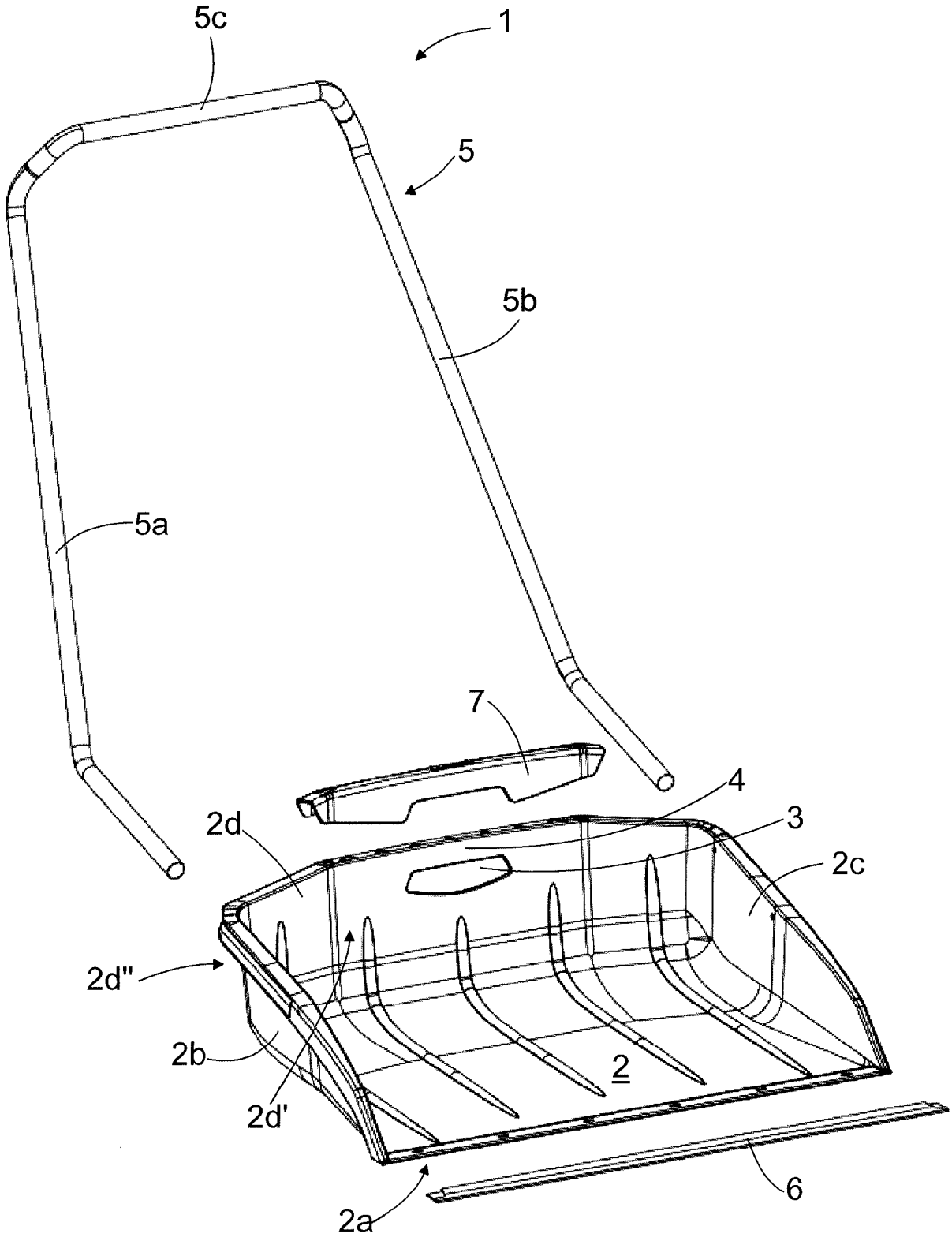

FIG. 1

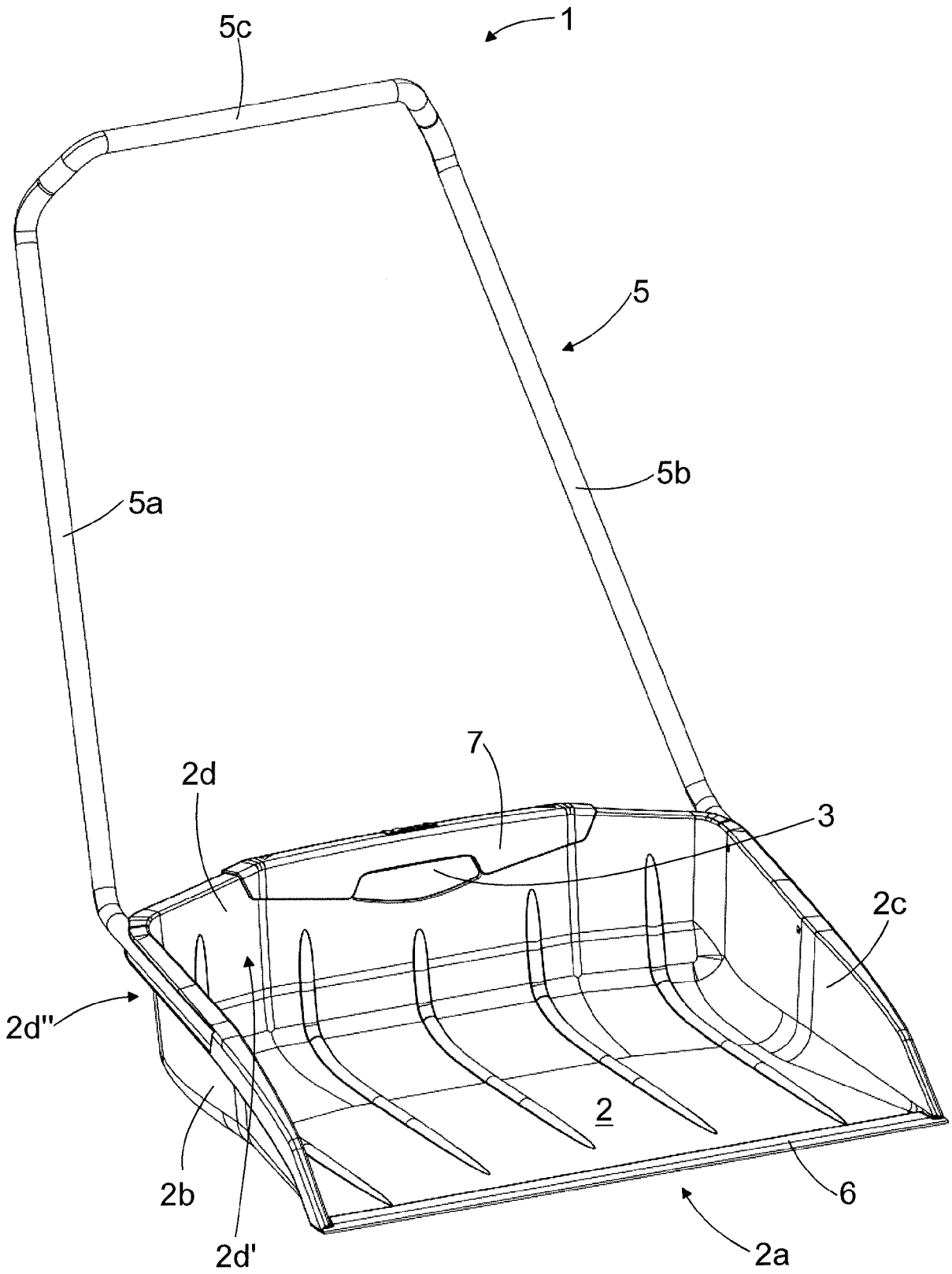

FIG. 2

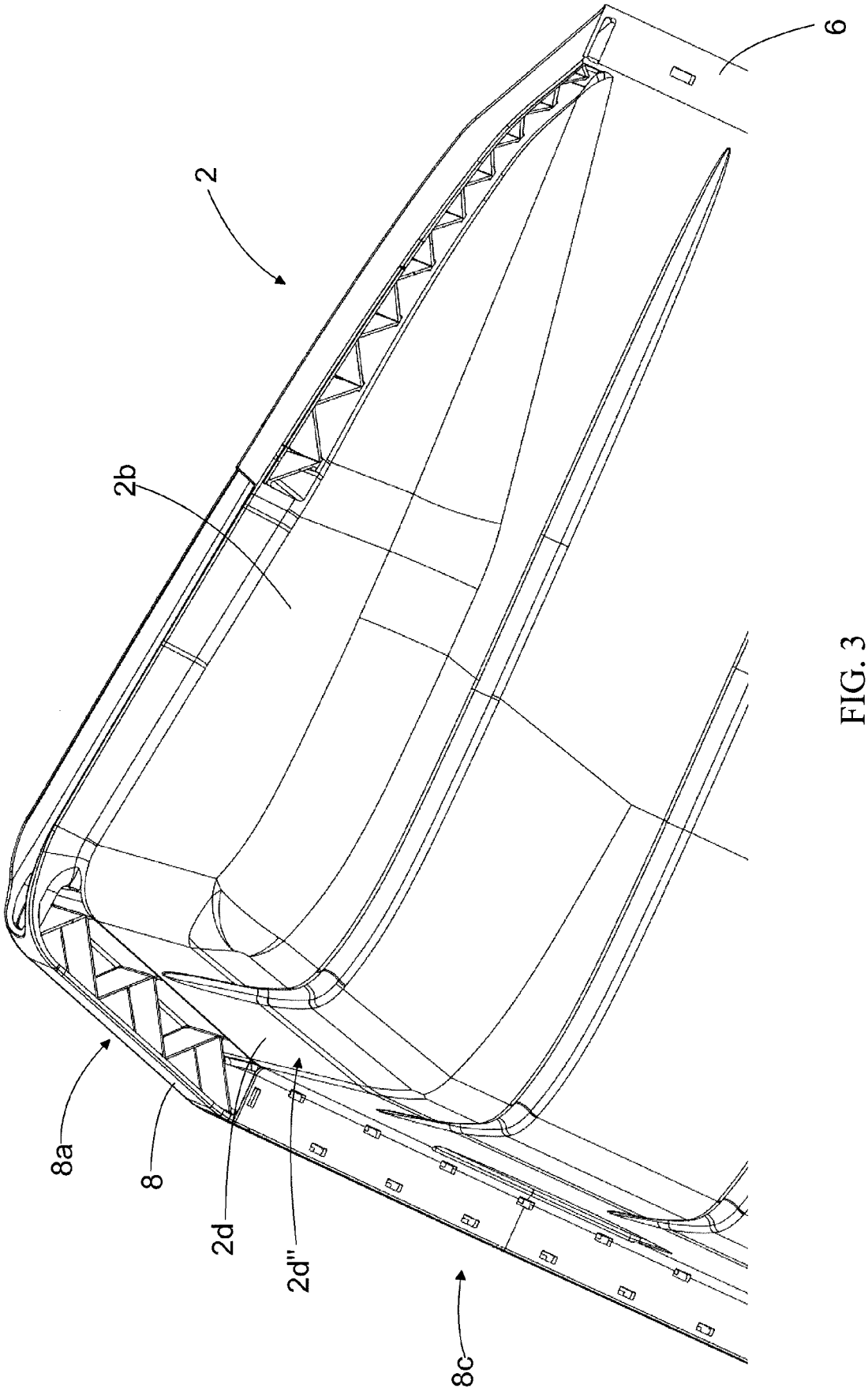

FIG. 3

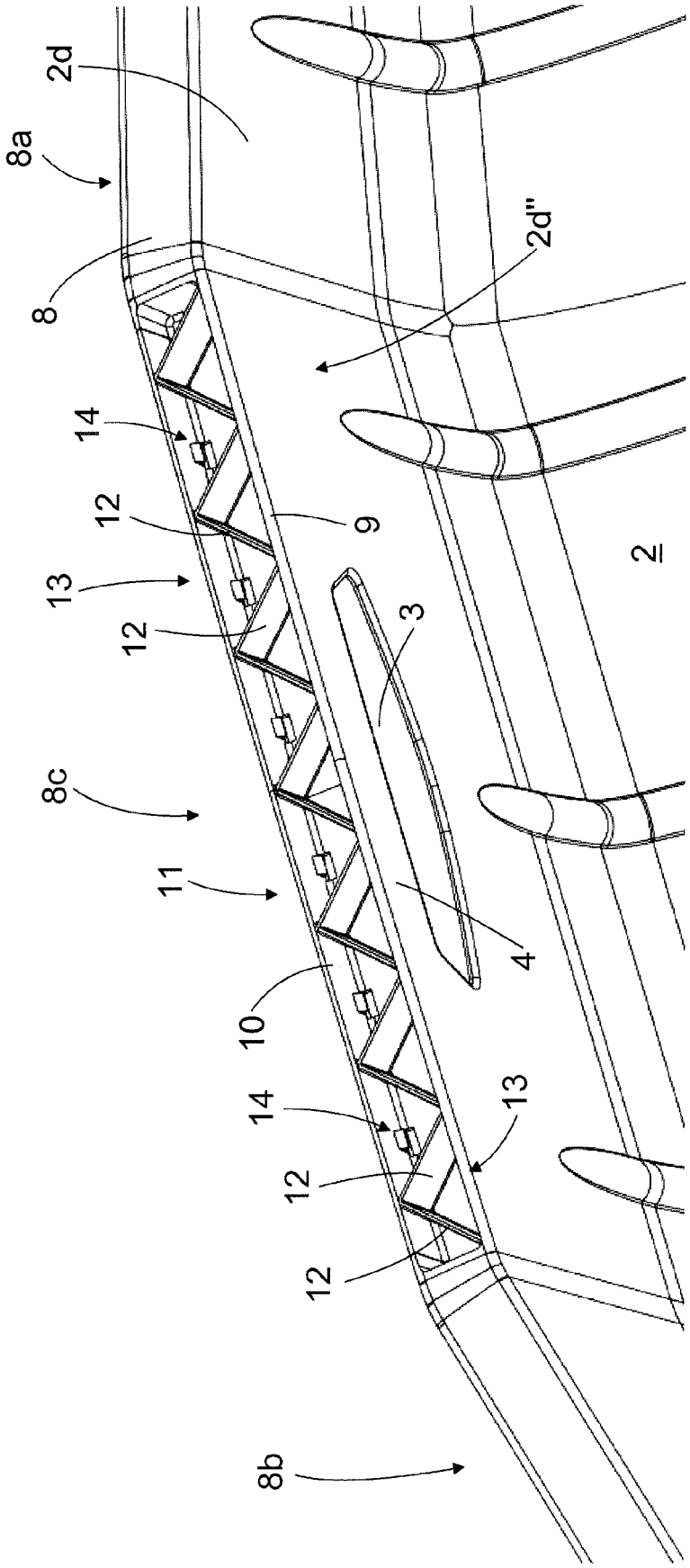

FIG. 4

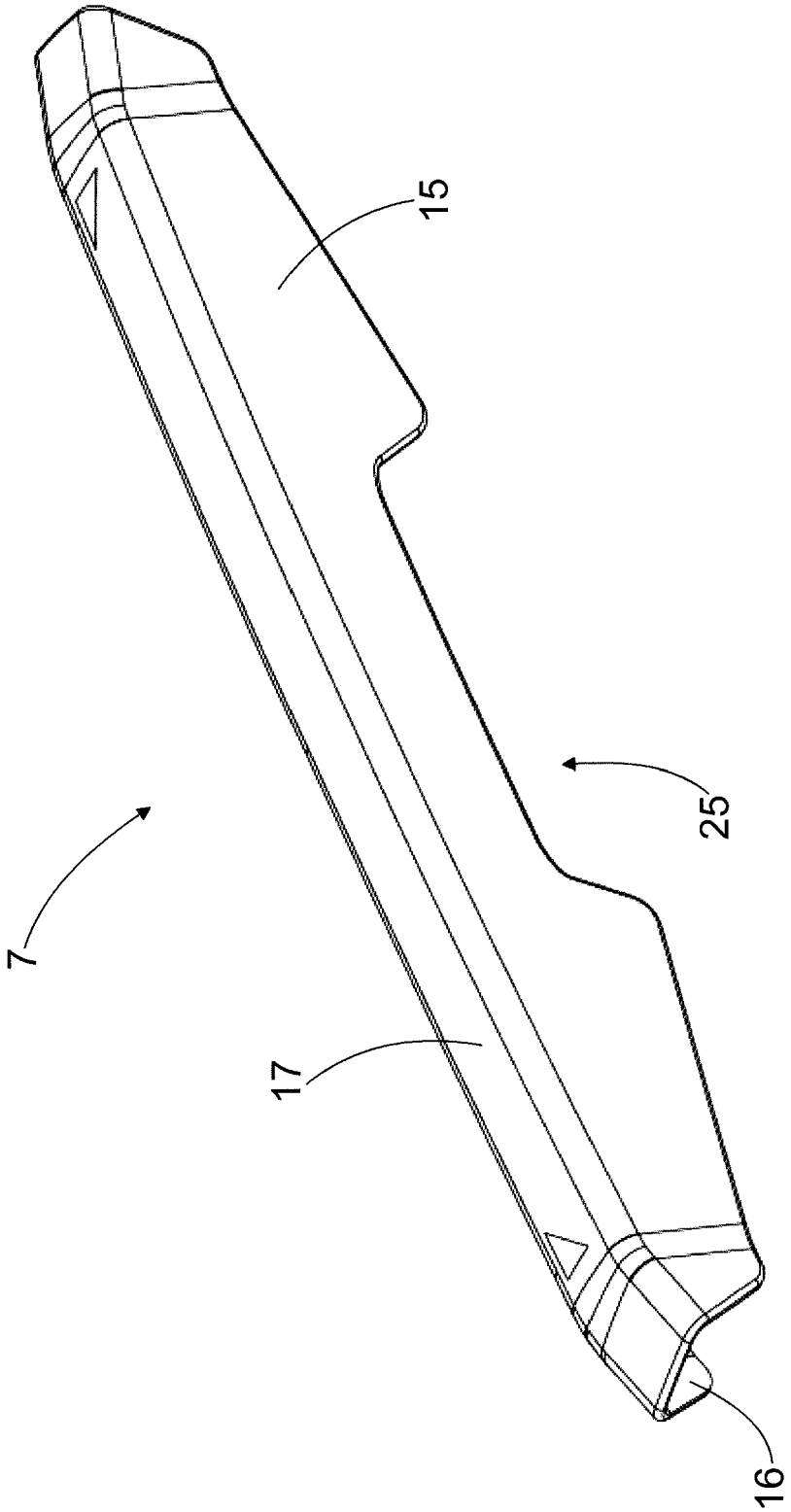

FIG. 5

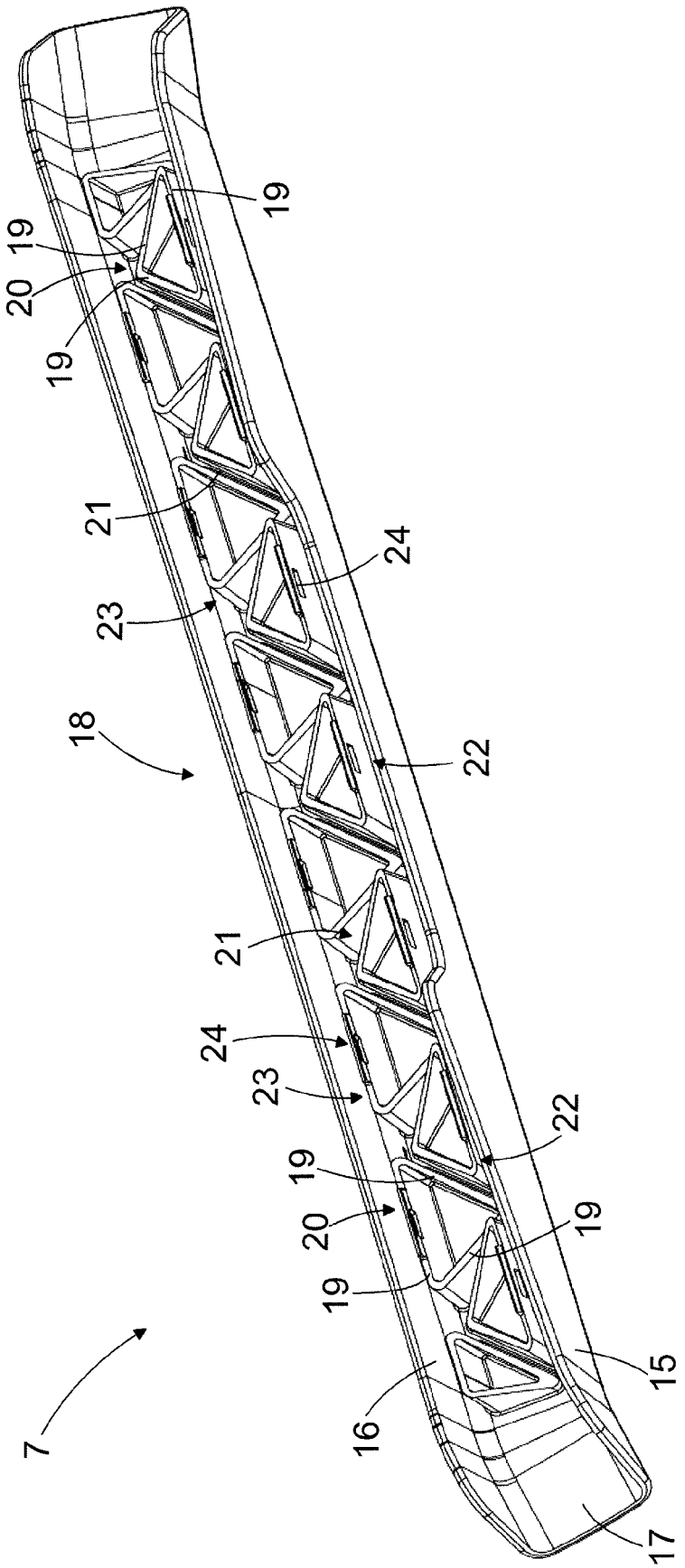

FIG. 6

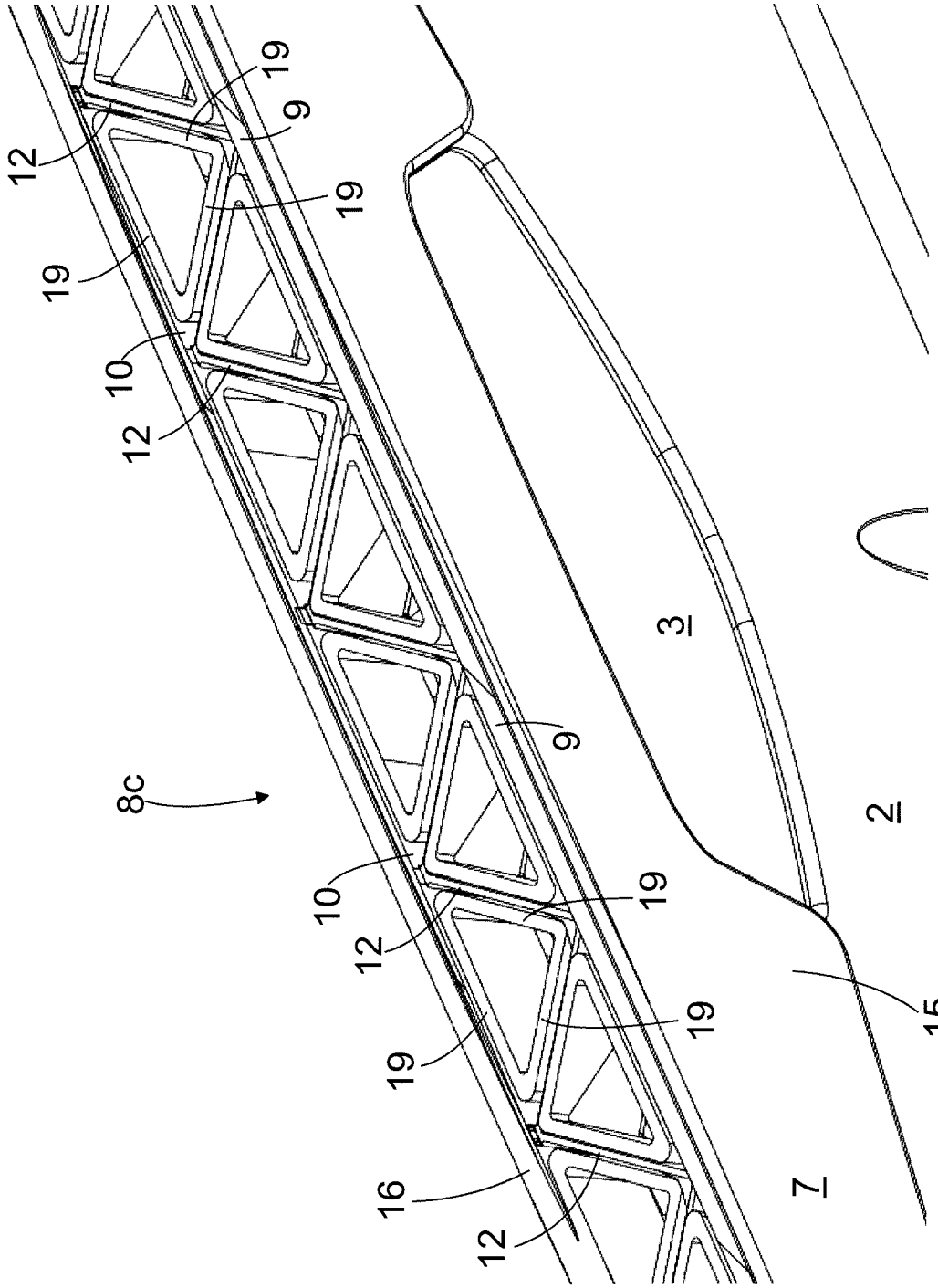

FIG. 7

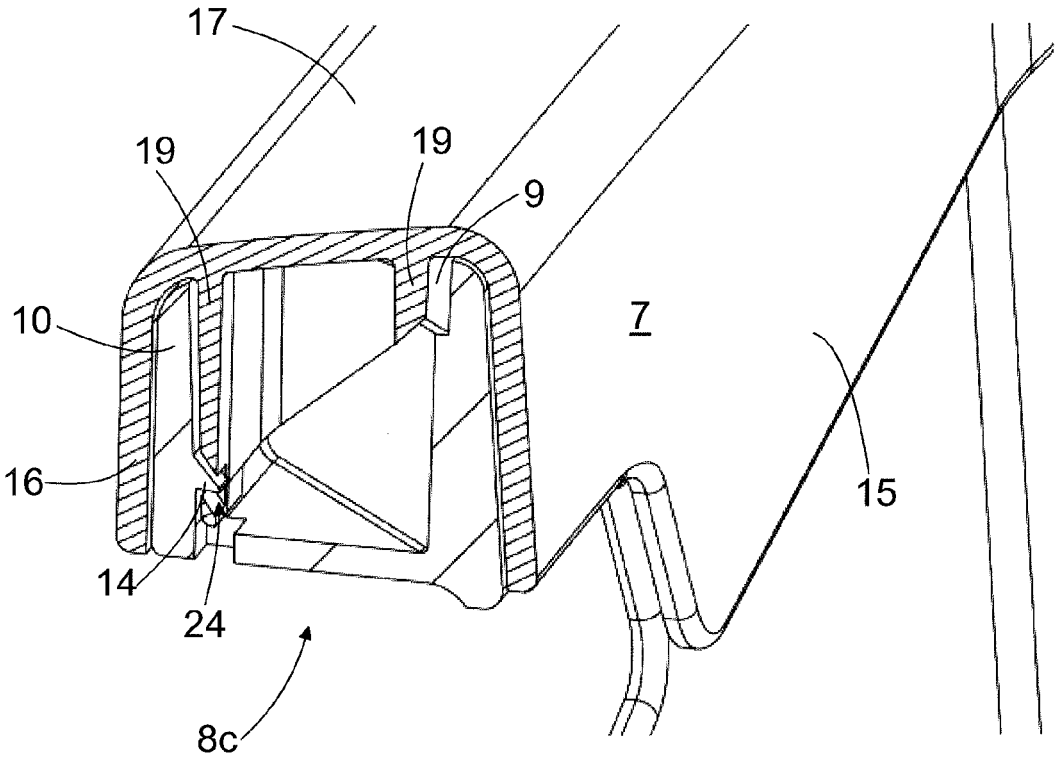

FIG. 8

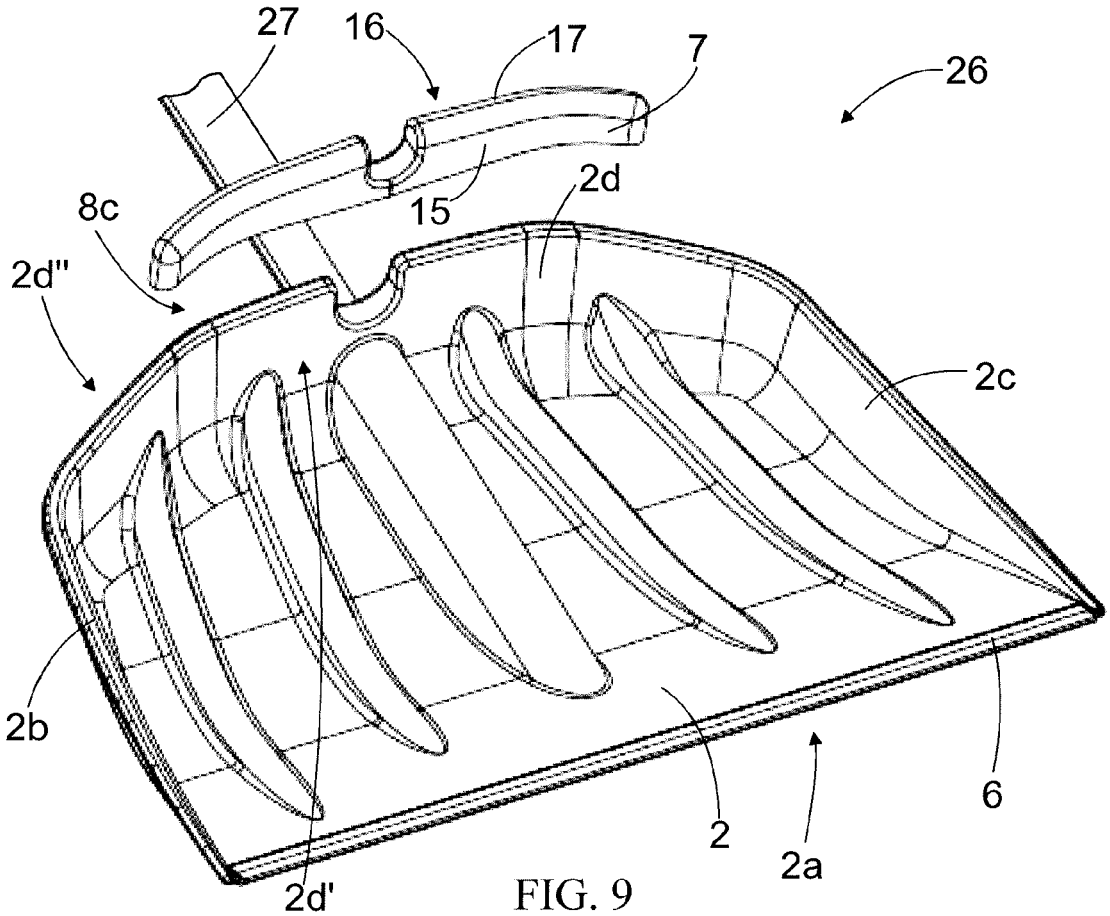

FIG. 9

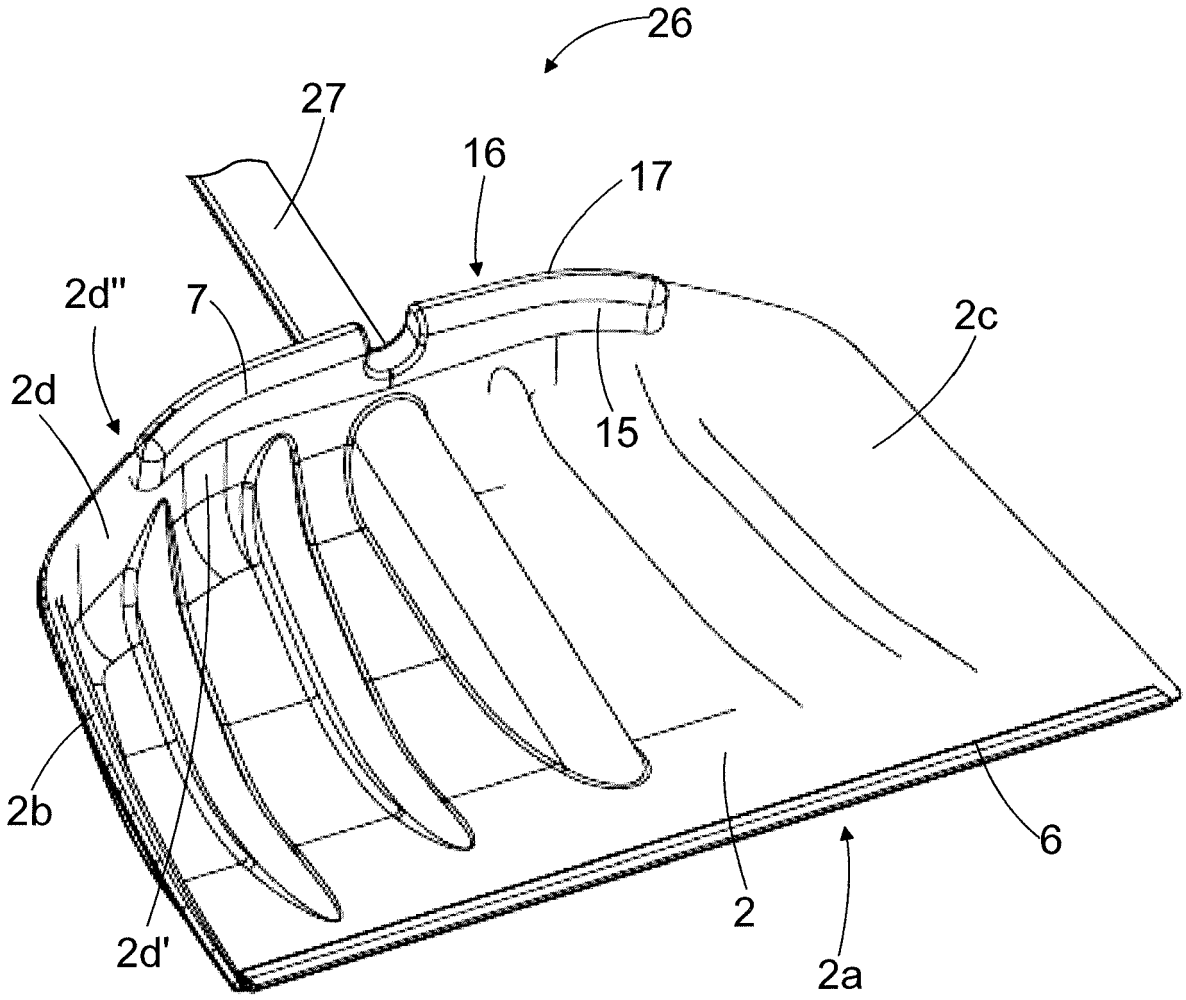

FIG. 10

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EUROPEAN SEARCH REPORT

Application Number
EP 15 20 2934

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	FI 891 867 A (GRIPIT OY AB [FI]) 20 October 1990 (1990-10-20) * abstract; figures 1,2 *	1-6,15	INV. E01H5/02
X	US 7 059 643 B1 (GHENT GINA S [US]) 13 June 2006 (2006-06-13) * figures 5-7 *	1-3	
X	US 4 103 383 A (MARTIN ALICE I) 1 August 1978 (1978-08-01) * figures 1,3 *	1,14	
A	US 7 156 435 B1 (MOURELATOS COSTANTINOS [US] ET AL) 2 January 2007 (2007-01-02) * figure 8 *	7	

TECHNICAL FIELDS SEARCHED (IPC)

E01H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	5 July 2016	Saretta, Guido

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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