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(54) A tool for cleaning at least part of a roof

(57) A tool (1) for cleaning at least part of a roof (21), the tool (1) comprising a handle part (2) and a tool head (4). The tool head (4) comprises an advancing portion (5) adapted to provide easy advancement of the tool head (4) along a roof part to be cleaned, and a cleaning portion (7) adapted to perform cleaning operations on a roof part. The tool head (4) is shiftable between a first state and a second state. In the first state the advancing portion (5) is oriented in a predefined direction, preferably towards

a roof (21), and the tool (1) is adapted to advance the tool head (4) along a roof part. In n the second state the cleaning portion (7) is oriented in said predefined direction, and the tool (1) is adapted to perform cleaning operations on a roof part.

Since the tool head (4) is shiftable between the two states it is easy to advance the tool head (4) as well as to perform relevant cleaning operations. The tool (1) may be operated from a ground position.

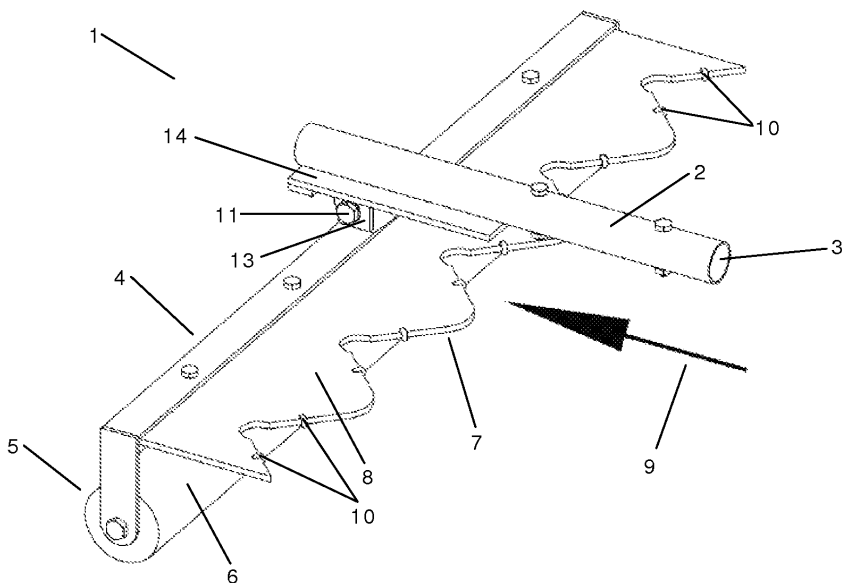


Fig. 1

## Description

### FIELD OF THE INVENTION

**[0001]** The present invention relates to a tool for cleaning a roof or a part of a roof, in particular an inclining part of a roof. More particularly, the present invention relates to a tool which can be used for cleaning a roof or a part of a roof in an easy manner and while the operator is positioned on the ground.

### BACKGROUND OF THE INVENTION

**[0002]** It is sometimes desirable to clean a roof or a part of a roof. This is, e.g., the case when leaves or needles from pines or firs aggregate on the roof, when snow is built up on the roof, or when moss grows on the roof. Such unwanted elements must be removed, e.g. by brushing, sweeping, scraping or spraying, in order to protect the roof.

**[0003]** In some cases it is necessary that the person performing the cleaning of the roof climbs the roof or at least a ladder. This is a disadvantage, since it introduces the risk of injuries or fatalities to the person. Furthermore, there is an upper limit to the time interval a person is allowed to work on a roof or a ladder. Finally, cleaning a roof in this manner is often very time consuming.

**[0004]** Attempts to address this problem have previously been made. Thus, US 2002/0190145 discloses a roof cleaning system including a telescoping tube fluidly connectable to a hose of a pump, a plurality of nozzles fluidly connected to the telescoping tube, and a pair of wheels for movably supporting the device. It is thereby possible to roll the system across the roof by means of the wheels while applying water to the roof via the nozzles. The operator can remain on the ground, due to the telescoping tube.

### SUMMARY OF THE INVENTION

**[0005]** It is an object of the invention to provide a tool for cleaning at least part of a roof, the tool being easier to operate than similar prior art tools.

**[0006]** It is a further object of the invention to provide a tool for cleaning at least part of a roof, the tool allowing reduction of the time consumption of cleaning operations as compared to similar prior art tools.

**[0007]** It is an even further object of the invention to provide a tool for cleaning at least part of a roof, which is less strenuous to operate than similar prior art tools.

**[0008]** According to the invention the above and other objects are fulfilled by providing a tool for cleaning at least part of a roof, the tool comprising a handle part and a tool head, said tool head comprising

- an advancing portion adapted to provide easy advancement of the tool head along a roof part to be cleaned, and

- a cleaning portion adapted to perform cleaning operations on a roof part,

wherein the tool head is shiftable between a first state in which the advancing portion is oriented in a predefined direction and a second state in which the cleaning portion is oriented in said predefined direction, and wherein the tool is adapted to advance the tool head along a roof part when the tool head is in the first state, and the tool is adapted to perform cleaning operations on a roof part when the tool head is in the second state.

**[0009]** The tool may be used for cleaning an entire roof, or it may be used selectively to clean only a part of a roof, e.g. a part onto which moss is growing.

**[0010]** The handle part may be a part which is adapted to be held directly by an operator during operation of the tool. Alternatively, the handle part may be connectable to such a part. In this case the handle part may advantageously be connectable to an extension shaft, e.g. in the form of a telescopic shaft. This will be described further below.

**[0011]** The tool head comprises an advancing portion and a cleaning portion. The advancing portion is adapted to provide easy advancement of the tool head along a roof part to be cleaned. Accordingly, the tool head can easily be moved on the roof when cleaning operations are not performed, and it is thereby easy to move the tool head between areas of the roof which need to be cleaned.

**[0012]** The cleaning portion is adapted to perform cleaning operations on a roof part. The cleaning operations may, e.g., be in the form of brushing or sweeping the roof, applying liquid, such as water, disinfectant, cleaning material, etc. to the roof, scraping moss off the roof, etc. Accordingly, the cleaning portion is used during performance of cleaning operations of the roof.

**[0013]** The tool head is shiftable between a first state and a second state. In the first state the advancing portion is oriented in a predefined direction, preferably towards a roof part to be cleaned, and in the second state the cleaning portion is oriented in the predefined direction.

When the tool head is in the first state it is adapted to advance the tool head along a roof part, and when the tool head is in the second state it is adapted to perform cleaning operations on a roof part. Accordingly, the tool head is shiftable between a state in which it can be easily advanced along the roof and a state in which cleaning operations can be performed. This makes it easy to operate the tool, since it is possible to move the tool along the roof while selectively choosing whether the tool head should be used for cleaning or it should merely be moved to the next area needing cleaning. For instance, it is possible to advance the tool head in an upwards direction towards the roof ridge and perform cleaning operation in a downwards direction towards the gutter of the roof. Furthermore, this lowers the time required to clean a specific area of a roof, and makes it less strenuous for the operator to perform the cleaning. Finally, the tool head only has to be lifted to a lower part of the roof, near the gutter

of the roof, and the rest of the roof can then be reached by moving the tool head using the advancing portion.

**[0014]** The cleaning portion may comprise means for detachably attaching a cleaning module, and an attached cleaning module may define a kind of cleaning operation to be performed by the tool. According to this embodiment, the cleaning module can be removed or replaced. Preferably, two or more cleaning modules may selectively be attached to the cleaning portion via the attaching means. In this case it is possible to select a cleaning module corresponding to a cleaning operation to be performed. For instance, it may be possible to choose between a broom, a brush and a scraper, depending on which kind of cleaning operation it is desired to perform. Alternatively or additionally, it may be possible to choose between cleaning modules of various shape, size or material, depending on the shape or material of the roof to be cleaned.

**[0015]** The cleaning module may be selected from the group consisting of brooms, brushes, scrapers, nozzles and liquid applicators.

**[0016]** Brooms may advantageously be used for sweeping a roof, e.g. in order to remove leaves or needles from pines or firs from the roof.

**[0017]** Brushes may advantageously be used for removing unwanted elements which stick more firmly to the roof, and therefore need brushing in order to be removed. The brushing operation may be performed manually by the operator moving the entire tool. Alternatively, the brush may be mounted in a movable manner, e.g. being able to perform rotational or reciprocal movements with respect to the tool head. A brush may advantageously be combined with one or more applicators supplying water, possibly mixed with cleaning material, disinfectant or the like.

**[0018]** Scrapers may advantageously be used for removing unwanted growth on the roof, notably moss growth. The scraper is preferably made from a relatively stiff material, e.g. a metal, such as aluminium or stainless steel. As an alternative, the scraper may be made from a plastic material, or from a synthetic fibre material, such as nylon. This is, e.g., an advantage if it is desired to use the scraper on an asbestos containing roof, in which case legislation prevents the use of metal tools due to the risk of damaging the roof and releasing asbestos.

**[0019]** As another alternative, a metal scraper may be provided with roof interfacing parts made from a softer material, such as plastic, nylon or rubber. In this case the entire scraper may be coated with the softer material, an edge of the scraper may be coated with the softer material, or an edge of the scraper may be provided with distance parts made from the softer material, the distance parts being arranged to abut the roof while preventing the metal edge from abutting the roof.

**[0020]** Nozzles may be in the form of ordinary nozzles, such as nozzles delivering liquid which is not pressurized or at a low pressure, and/or in the form of nozzles being capable of delivering a liquid under pressure, e.g. for high

pressure washing of the roof.

**[0021]** Liquid applicators may advantageously be used for providing liquid to the roof. Examples of suitable liquids are water, cleaning material, such as soap, disinfectant, pesticide for inhibiting growth of algae or moss, and insecticide. The liquid applicator may be in the form of one or more nozzles or openings. Alternatively, it may be in the form of a soft roller, similar to a paint roller, having a liquid supply in an interior part thereof, and allowing the liquid to penetrate through the soft part from the interior part.

**[0022]** The cleaning portion may comprise an interface having a shape which matches a profile of the roof part to be cleaned. In the case that the cleaning portion is adapted to carry a cleaning module as described above, the interface preferably forms part of the cleaning module. In the case that the roof to be cleaned is a wavy roof, e.g. a roof having profiled roof plates, the interface of the cleaning portion preferably has a corresponding shape. Thereby it can be ensured that the 'valleys' of the roof are properly cleaned.

**[0023]** As an alternative, the cleaning portion may have a substantially straight or linear interface, regardless of the profile of the roof to be cleaned.

**[0024]** The tool head may be automatically shifted between the first state and the second state in response to a change of direction of movement of the tool head.

**[0025]** According to this embodiment, the tool is particularly easy to operate, since a simple change in direction of movement causes a desired shift between the two states. According to a preferred embodiment the tool head is in the first state when the tool head is moved upwards and away from the operator, i.e. towards the ridge of the roof, and the tool head is shifted to the second state when this movement is reversed, i.e. when the tool head is moved in a downwards direction towards the gutter of the roof and towards the operator. In this case it is easy to move the tool head when the force of gravity acts against the movement, and the cleaning operation is performed with the help of the force of gravity. Furthermore, it is ensured that any dirt or the like removed from the roof during the cleaning is collected near the gutter or is pushed off the roof, rather than being collected near the ridge of the roof. Thereby such dirt can easily be removed after the cleaning of the roof has been completed.

**[0026]** As an alternative, the tool head may be manually shiftable between the first state and the second state, e.g. by pushing a button, pulling a wire or operating a handle.

**[0027]** The predefined direction may advantageously be a direction facing a roof part to be cleaned during normal operation of the tool. In this case the advancing portion faces the roof when the tool head is in the first state, and the cleaning portion faces the roof when the tool head is in the second state. Preferably, the advancing portion/the cleaning portion abuts the roof when the tool head is in the first/second state, respectively.

**[0028]** The advancing portion may comprise at least

one roller. According to this embodiment the tool head is rolled along the roof by means of the roller(s) when the tool head is in the first state. This is, e.g., an advantage when the roof to be cleaned has a wavy profile, because the roller in this case is able to roll along the 'hills' of the roof. Thereby it is possible to move the tool head transversely to waves of the roof profile, thereby making it easier to reach various areas of the roof, and accordingly making it easier to clean the entire roof. For instance, the tool may be operated in such a manner that it is moved to the ridge of the roof at a desired position along the ridge. Then the tool head may be shifted to the second state and the tool head may be pulled away from the ridge and towards the gutter while performing an appropriate cleaning operation. This movement is preferably performed along the profile of the roof. Subsequently, the tool head is once again shifted to the first state and the tool head can be returned to a position near the ridge. This movement is preferably performed partly transversely to the profile of the roof, thereby allowing a subsequent cleaning operation to take place in a different area of the roof.

**[0029]** As an alternative to one or more rollers, the advancing portion may comprise one or more wheels, one or more runners, one or more smooth surfaces and/or any other suitable means adapted to facilitate movement of the tool head along a roof. Runners may advantageously be used in the case that snow has built up on the roof. The advancing portion may comprise an attachment portion for detachably attaching roller(s), wheel(s), runner(s), etc., e.g. in such a manner that a suitable device can be chosen depending on the circumstances.

**[0030]** The handle part may comprise or be connectable to a telescopic shaft. According to this embodiment, the tool can easily be operated from the ground.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0031]** The invention will now be described in further detail with reference to the accompanying drawings in which

Fig. 1 is a perspective view of a tool according to an embodiment of the invention shown in the first state,

Fig. 2 is a side view of the tool of Fig. 1 in the first state,

Fig. 3 is a front view of the tool of Fig. 1 in the first state,

Fig. 4 is a top view of the tool of Fig. 1 in the first state,

Fig. 5 is a perspective view of the tool of Fig. 1 shown in the second state,

Fig. 6 is a side view of the tool of Fig. 5 in the second state,

Fig. 7 is a front view of the tool of Fig. 5 in the second state,

Fig. 8 is a top view of the tool of Fig. 5 in the second state,

Fig. 9 is a perspective view of the tool of Figs. 1 and 5, illustrating various advancing portions,

Fig. 10 is a perspective view of the tool of Figs. 1 and 5, illustrating various cleaning modules to be attached to the cleaning portion, and

Fig. 11 illustrates operation of the tool of Figs. 1 and 5.

#### DETAILED DESCRIPTION OF THE DRAWINGS

**[0032]** Fig. 1 is a perspective view of a tool 1 for cleaning a roof or a part of a roof. The tool 1 comprises a handle part 2 having a portion 3 for attaching a shaft, e.g. a telescopic shaft, to the handle part 2. The tool 1 further comprises a tool head 4 attached to the handle part 2. The tool head 4 comprises an advancing portion 5 being provided with a roller 6 and a cleaning portion 7 being provided with a profiled scraper 8.

**[0033]** In Fig. 1 the tool 1 is shown in the first state, i.e. the advancing portion 5, and thereby the roller 6, is oriented in a substantially downwards direction. Thus, when the tool 1 is positioned on a roof, the roller 6 is arranged in abutment with the roof, and the tool head 4 can easily be advanced along the roof by means of the roller 6, as long as the tool head 4 is moved in the direction indicated by arrow 9. When the tool head 4 is moved in a reverse direction the tool head 4 is shifted to the second state. This will be described in further detail below.

**[0034]** The scraper 8 is provided with ten distance portions 10 arranged along an edge of the scraper 8. The distance portions 10 are made from a material which is softer than the material of the scraper 10. The function of the distance portions 10 will be described further below.

**[0035]** Fig. 2 is a side view of the tool 1 of Fig. 1. When the tool head 4 is moved in the direction indicated by arrow 9 the tool head 4 is caused to rotate about pivot 11 in the direction indicated by arrow 12 until abutment portion 13 abuts plate 14. Continued movement of the tool head 4 in the direction indicated by arrow 9 causes the tool head 4 to remain in this position, thereby maintaining the tool head 4 in the first state.

**[0036]** Fig. 3 is a front view of the tool 1 of Fig. 1. The roller 6 is clearly visible.

**[0037]** Fig. 4 is a top view of the tool of Fig. 1. The scraper 8 is clearly visible.

**[0038]** Fig. 5 is a perspective view of the tool 1 of Fig. 1. However, in Fig. 5 the tool head 4 is shown in the second state, i.e. the scraper 8 is oriented in a substantially downwards direction, i.e. in the direction in which

the roller 6 was oriented in Fig. 1. Accordingly, when the tool head 4 is in this state, the scraper 8 can be arranged in abutment with a roof to be cleaned. Thereby the scraper 8 can be used for cleaning the roof in a scraping operation, as long as the tool head 4 is moved along the direction indicated by arrow 15.

**[0039]** The scraper 8 has a profiled edge which matches a waved roof profile. The distance portions 10 are arranged in such a manner they provide an interface between the scraper 8 and the roof, thereby preventing the actual edge of the scraper 8 from contacting the roof during cleaning. Since the distance portions 10 are made from a material which is softer than the material of the scraper, this allows the scraper 8 to be used on asbestos containing roofs.

**[0040]** Fig. 6 is a side view of the tool 1 of Fig. 5. Comparing Fig. 6 and Fig. 2 it is clear that the tool head 4 has been moved to the second state, and that the scraper 8 is oriented in a substantially downwards direction.

**[0041]** When the tool head 4 is moved along the direction indicated by arrow 15 the tool head 4 is caused to rotate about pivot 11 along the direction indicated by arrow 16 until advancing portion 5 abuts plate 14 as shown in Fig. 5. Continued movement of the tool head 4 in the direction indicated by arrow 15 causes the tool head 4 to remain in this position, thereby maintaining the tool head 4 in the second state.

**[0042]** Fig. 7 is a front view of the tool 1 of Fig. 5. The scraper 8 is clearly visible.

**[0043]** Fig. 8 is a top view of the tool of Fig. 5. The roller 6 is clearly visible.

**[0044]** Fig. 9 is a perspective view of the tool 1 of Figs. 1 and 5. In Fig. 9 the roller 6 has been detached from the advancing portion 5. Furthermore, a runner 17 and a set of wheels 18 have been shown, thereby illustrating that any one of the roller 6, the runner 17 and the set of wheels 18 may be mounted on the advancing portion 5, depending on the kind of roof to be cleaned, the kind of cleaning operation to be performed, and/or any other relevant circumstances.

**[0045]** Fig. 10 is a perspective view of the tool 1 of Figs. 1 and 5. In Fig. 10 the scraper 8 has been detached from the cleaning portion 7. Furthermore, a broom 19 is shown, thereby illustrating that the scraper 8 as well as the broom 19 may be mounted on the cleaning portion 7. Accordingly, an appropriate tool can be selected, depending on the kind of cleaning operation it is desired or necessary to perform. Thus, in the case that a scraping operation is required, e.g. in order to remove moss from the roof, the scraper 8 can be mounted on the cleaning portion 7. Similarly, in the case that a sweeping operation is required, e.g. in order to remove leaves or needles from pines or firs, or in order to remove moss which has previously been scraped loose using the scraper 8, the broom 19 can be mounted on the cleaning portion 7. Accordingly, a very flexible tool 1 has been provided. The broom 19 is provided with a profiled edge, and it thereby matches a profiled roof. Accordingly, it is possible to per-

form sweeping operations which clean the 'valleys' of such a roof in a proper manner.

**[0046]** Fig. 11 illustrates operation of the tool 1 of Figs. 1 and 5. In Fig. 11 a person 20 is shown operating the tool 1 which is arranged on a roof 21 of a house 22. The tool 1 is provided with a telescopic shaft 23 allowing the person 20 to operate the tool 1 from the ground. The tool head 4 of the tool 1 is in its first state, i.e. the roller 6 faces the roof 21. In this position the tool 1 can easily be advanced towards the ridge 24 of the roof 21, i.e. in the direction indicated by arrow 25. When the tool head 4 reaches a desired position, e.g. at or near the ridge 24 of the roof 21, the person 20 pulls the tool 1 in the direction indicated by arrow 26. As described above, this causes the tool head 4 to shift to its second position, where the scraper 8 is oriented towards the roof 21. By continuously pulling the tool 1 in the direction indicated by arrow 26 the scraper 8 is caused to scrape across the roof 21, thereby scraping any undesired elements or items away from the roof 21.

## Claims

1. A tool for cleaning at least part of a roof, the tool comprising a handle part and a tool head, said tool head comprising

- an advancing portion adapted to provide easy advancement of the tool head along a roof part to be cleaned, and
- a cleaning portion adapted to perform cleaning operations on a roof part,

wherein the tool head is shiftable between a first state in which the advancing portion is oriented in a predefined direction and a second state in which the cleaning portion is oriented in said predefined direction, and wherein the tool is adapted to advance the tool head along a roof part when the tool head is in the first state, and the tool is adapted to perform cleaning operations on a roof part when the tool head is in the second state.

2. A tool according to claim 1, wherein the cleaning portion comprises means for detachably attaching a cleaning module, and wherein an attached cleaning module defines a kind of cleaning operation to be performed by the tool.

3. A tool according to claim 2, wherein two or more cleaning modules may be selectively attached to the cleaning portion via the attaching means.

4. A tool according to claim 2 or 3, wherein the cleaning module is selected from the group consisting of brooms, brushes, scrapers, nozzles and liquid applicators.

5. A tool according to any of the preceding claims,  
wherein the cleaning portion comprises an interface  
having a shape which matches a profile of the roof  
part to be cleaned.
- 5
6. A tool according to any of the preceding claims,  
wherein the tool head is automatically shifted be-  
tween the first state and the second state in response  
to a change of direction of movement of the tool head.
- 10
7. A tool according to any of the preceding claims,  
wherein the predefined direction is a direction facing  
a roof part to be cleaned during normal operation of  
the tool.
- 15
8. A tool according to any of the preceding claims,  
wherein the advancing portion comprises at least  
one roller.
- 20
9. A tool according to any of the preceding claims,  
wherein the handle part comprises or is connectable  
to a telescopic shaft.

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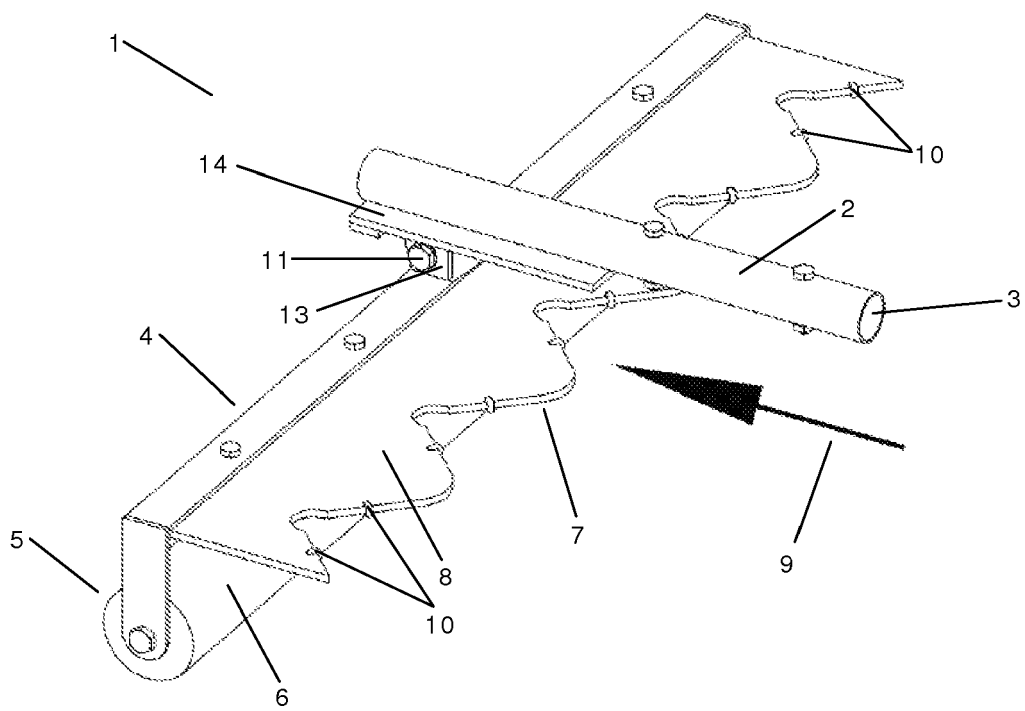


Fig. 1

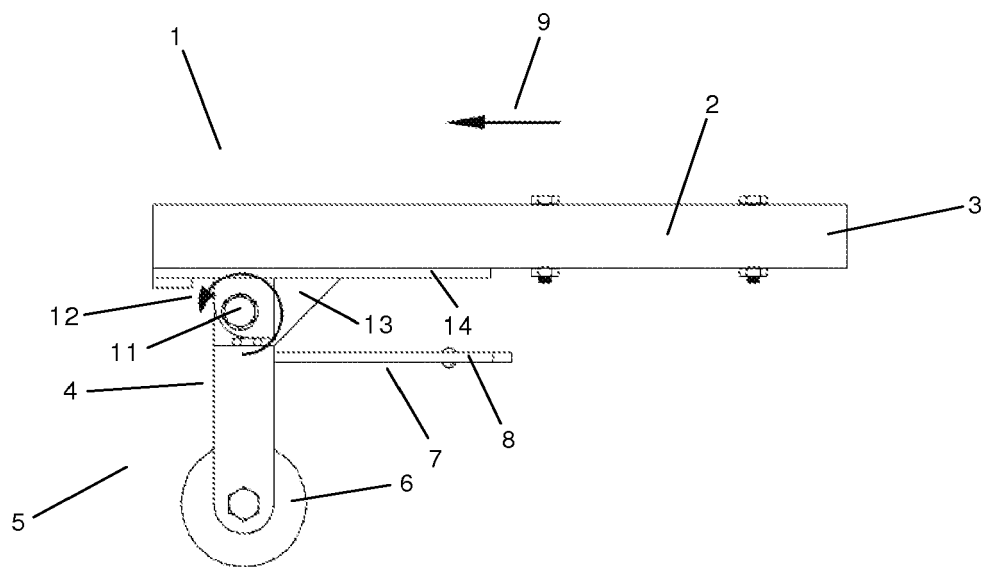


Fig. 2

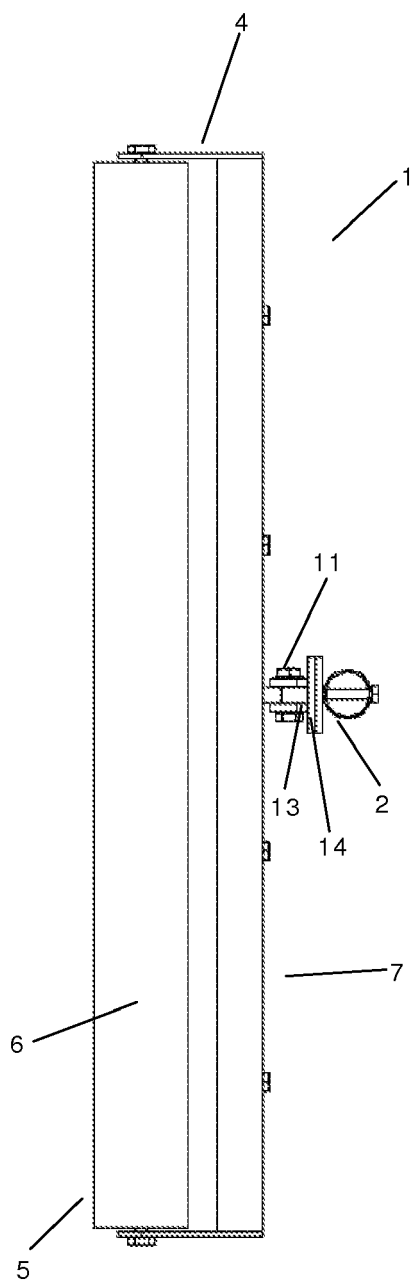


Fig. 3

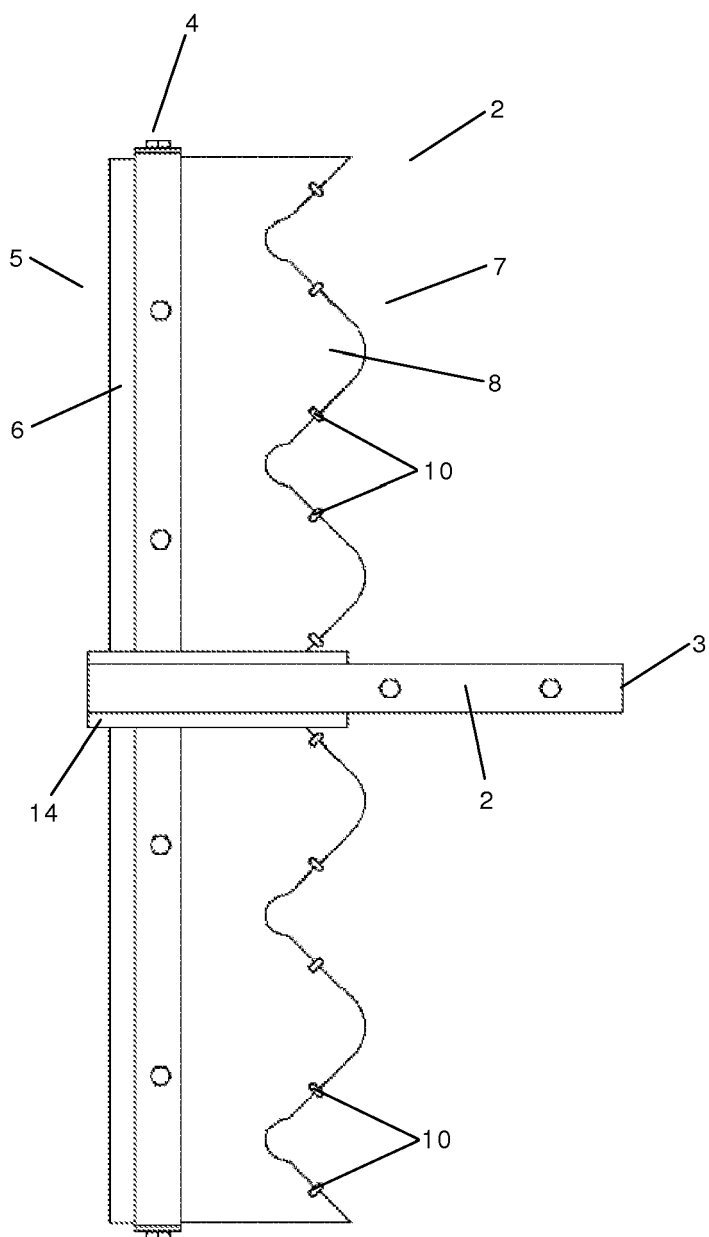


Fig. 4

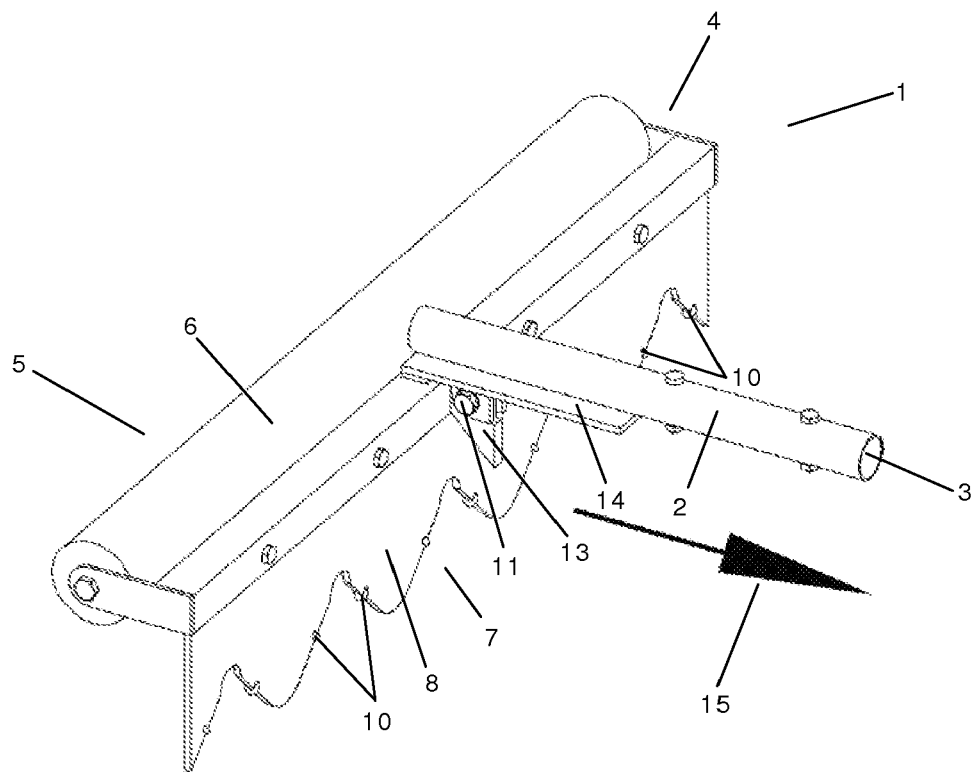


Fig. 5

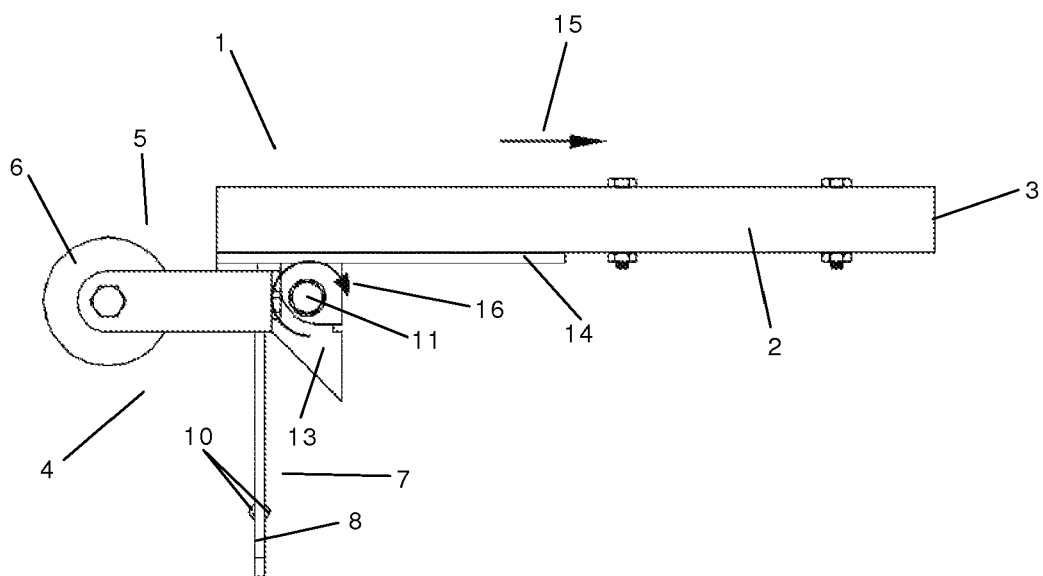


Fig. 6

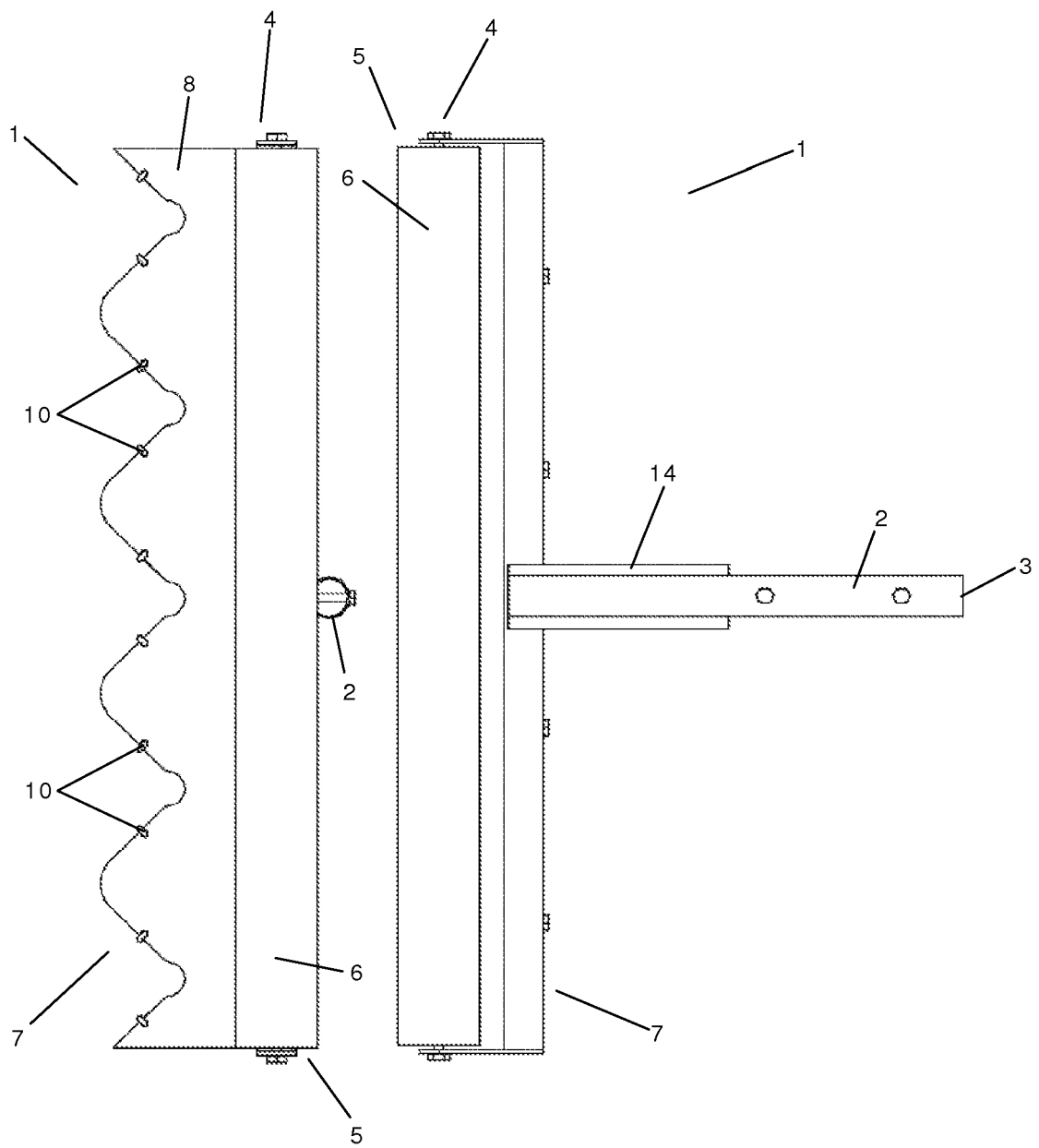


Fig. 7

Fig. 8

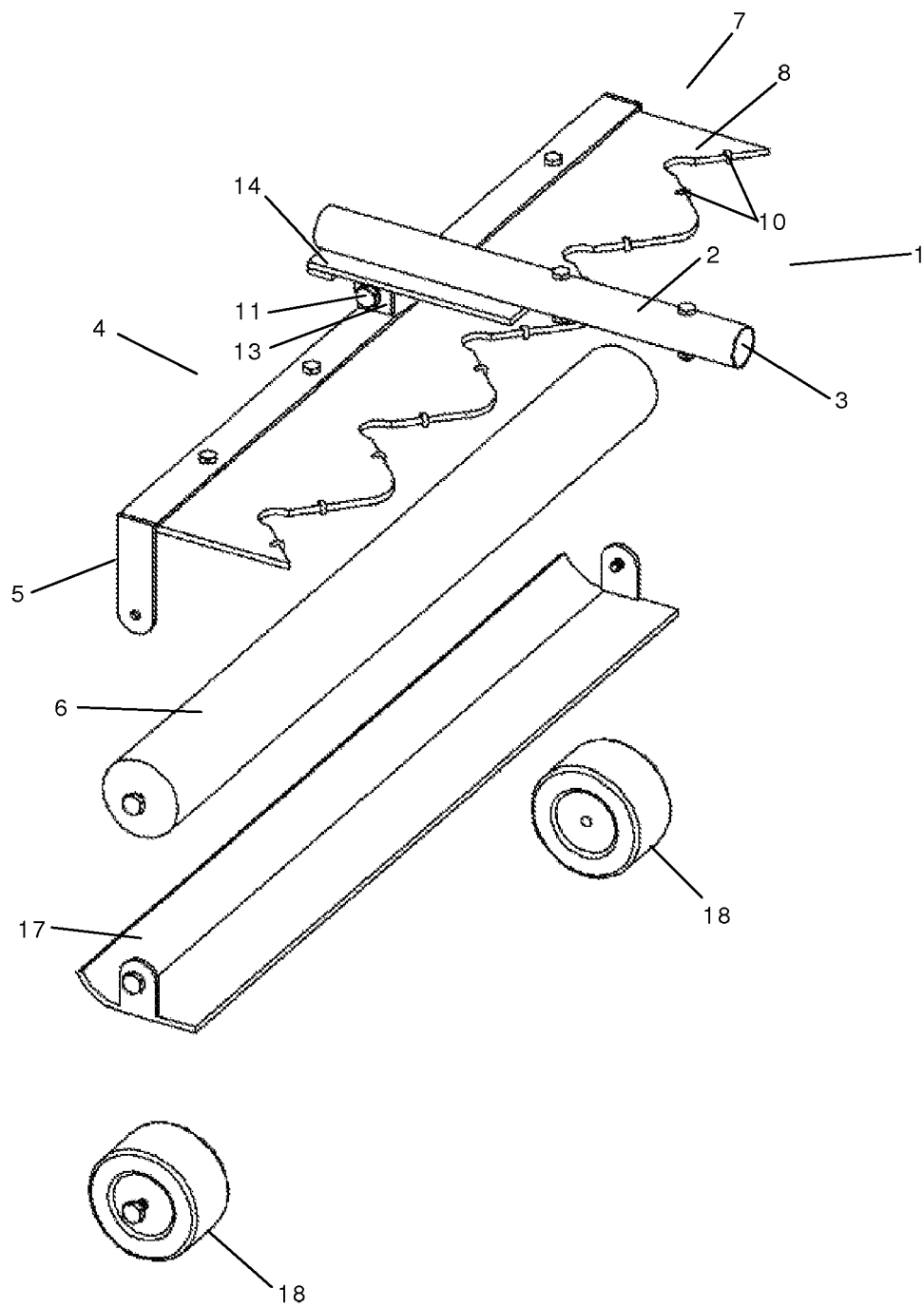


Fig. 9

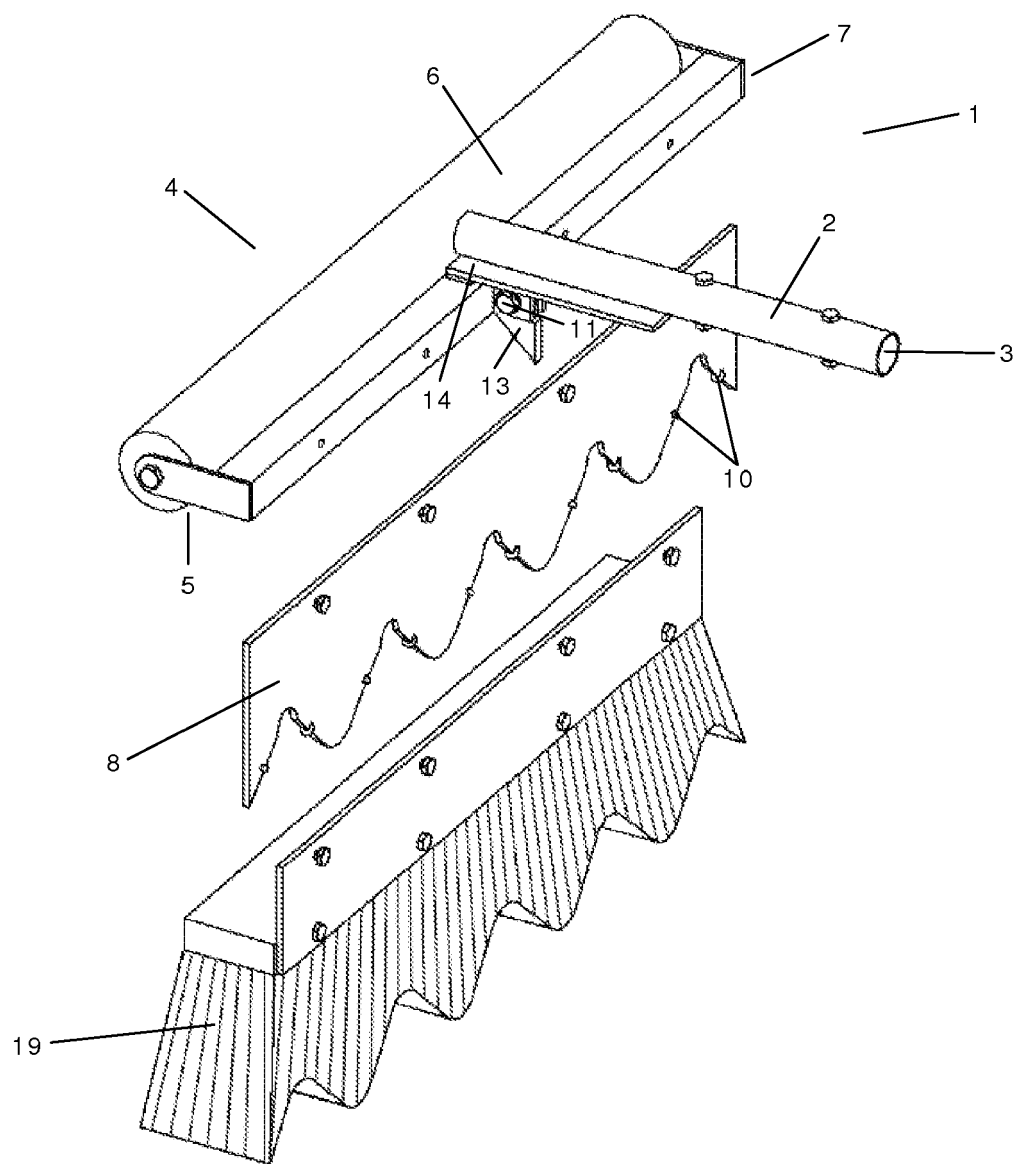


Fig. 10

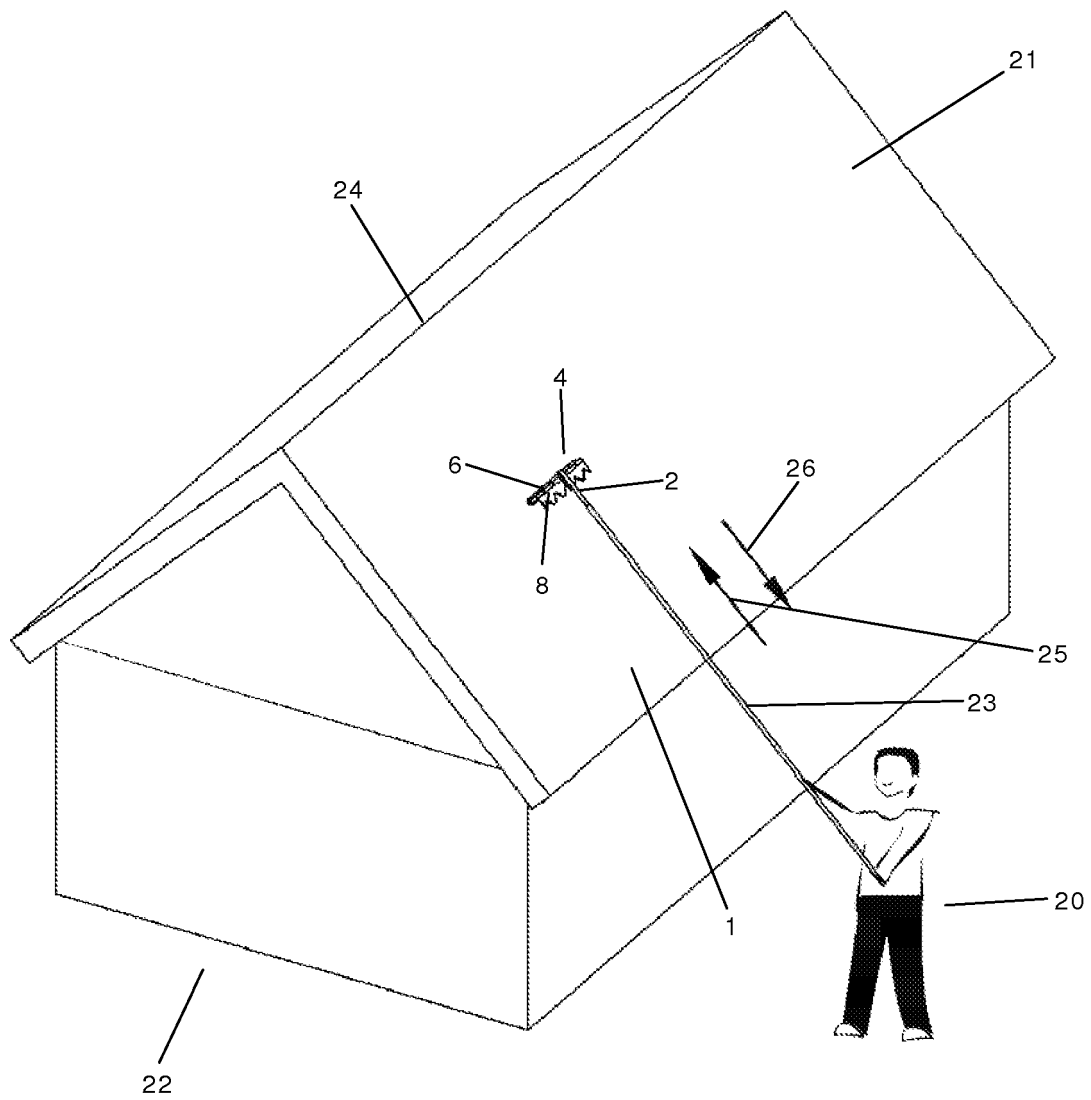


Fig. 11



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 08 15 3315

| 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                                                                                                                                                                                                                                                      | US 4 249 767 A (ANDREASEN)<br>10 February 1981 (1981-02-10)<br>* column 3, line 62 - column 5, line 38;<br>figures * | 1-9                                                                                                                                                                                                                                                                                   | INV.<br>E04D15/00<br>B08B1/00<br>A46B13/08 |
| X                                                                                                                                                                                                                                                      | US 5 524 369 A (PHILLIPS)<br>11 June 1996 (1996-06-11)<br>* column 3, line 27 - column 5, line 33;<br>figures *      | 1-5,7-9                                                                                                                                                                                                                                                                               |                                            |
| A                                                                                                                                                                                                                                                      | US 3 583 747 A (LAMBERT)<br>8 June 1971 (1971-06-08)<br>* abstract; figures *                                        | 1,6,7,9                                                                                                                                                                                                                                                                               |                                            |
| A                                                                                                                                                                                                                                                      | DE 203 01 253 U (GOLDBERG ET AL.)<br>3 April 2003 (2003-04-03)<br>* abstract; figures *                              | 4,5                                                                                                                                                                                                                                                                                   |                                            |
|                                                                                                                                                                                                                                                        |                                                                                                                      |                                                                                                                                                                                                                                                                                       | TECHNICAL FIELDS SEARCHED (IPC)            |
|                                                                                                                                                                                                                                                        |                                                                                                                      |                                                                                                                                                                                                                                                                                       | E04D<br>B08B<br>A46B                       |
| The present search report has been drawn up for all claims                                                                                                                                                                                             |                                                                                                                      |                                                                                                                                                                                                                                                                                       |                                            |
| Place of search<br>The Hague                                                                                                                                                                                                                           |                                                                                                                      | Date of completion of the search<br>25 August 2008                                                                                                                                                                                                                                    | Examiner<br>Righetti, Roberto              |
| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document |                                                                                                                      | T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>.....<br>& : member of the same patent family, corresponding document |                                            |

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 15 3315

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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25-08-2008

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**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

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