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(54) **Mobile sun blind**

(57) The invention relates to a mobile sun blind comprising a cloth (40) comprising two tubes (10, 11) provided on each one of two opposing sides of the cloth (40). Each respective set of two tubes (10, 11) fits within each other and is spring-mounted with respect to each other and is configured for being slide relative to each other. Ends of the two tubes (10, 11) are provided with a cap having friction with a window frame (50), a wall or a rigid object. The mobile sun blind is configured for being clamped in a window frame (50), between walls, or between rigid objects before a window, if desired, and wherein the mobile sun blind is configured for being quickly and simply rolled up and stored after use, wherein the cloth (40) is rolled on at least one of the sets of tubes (10, 11). The advantage of the mobile sun blind of the invention is that the window frame (50), wall or rigid object is not damaged when the mobile sun mounted. The invention further relates to a method of operating such a sun blind.

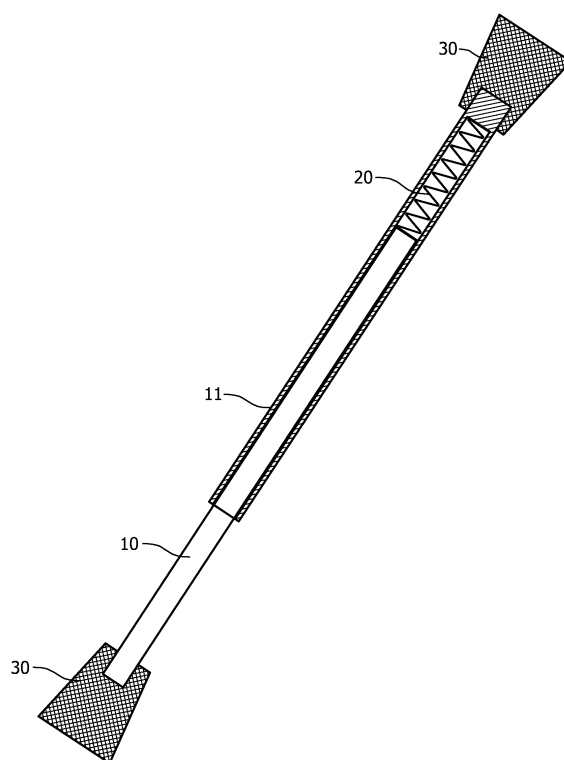


FIG. 1

Description

FIELD OF THE INVENTION

[0001] The invention relates to a mobile sun blind as an alternative to a fixed sun blind. The invention further relates to a method of operating such mobile sun blind.

BACKGROUND OF THE INVENTION

[0002] Today, many houses are provided with sun blinds, such as awnings and canopies, on windows. This is particular done on sides where the sun shines the most, which may be any side of the house.

[0003] In practice it is often unfeasible, superfluous, costly, and on a side facing the street sometimes even legally forbidden to provide all windows with awnings, canopies, and other forms of sun blinds.

[0004] DE 34 27 899 A1 discloses sun blind for windows, doors and roof windows. The blind is mounted to the window frame by means of two tubes which are connected to the window frame by means of brackets that receive the tubes. The brackets are screwed to the window frame.

[0005] US 4,539,238 discloses a window shade comprising a multiplicity of elongate fabric strips connected to one another along their longitudinal edges by means of severable connecting threads. Mounting and weighting rods inserted in respective pockets at the upper and lower end of the multistrip fabric web are adjustable in length to match the width of the window shade upon a reduction thereof owing to a tearing of one or more fabric strips from the body of the window shade web. The window shade web is advantageously provided with a foam backing which contributes in part to the mechanical stability of the shade. The window shade is mounted in a window frame by means of a spring-loaded mounting rod which has ends which are to be inserted in receiving holes in the window frame.

[0006] DE 28 13 212 discloses a window shade comprising a telescopic tube having parts which are spring-mounted with respect to each other having ends with protrusions which serve to prevent the tube to rotate or move when clamped between in window frame.

[0007] The known systems damaging of the window frame when they are mounted, because of involved screwing or sticking.

SUMMARY OF THE INVENTION

[0008] The invention is defined by the independent claims. The dependent claims define advantageous embodiments.

[0009] In a first aspect, the invention relates to a mobile sun blind comprising a cloth comprising two tubes provided on each one of two opposing sides of the cloth, wherein each respective set of two tubes fits within each other and is spring-mounted with respect to each other and is configured for being slide relative to each other,

wherein ends of the two tubes are provided with a cap having friction with a window frame, a wall or a rigid object, wherein the mobile sun blind is configured for being clamped in a window frame, between walls, or between rigid objects before a window, if desired, and wherein the mobile sun blind is configured for being quickly and simply rolled up and stored after use, wherein the cloth is rolled on at least one of the sets of tubes.

[0010] The effect of these features is that the window frame is left in tact, i.e. no damage is inflicted to the window frame, wall or rigid object, when the mobile sun blind is mounted.

[0011] An embodiment of mobile sun blind in accordance with the invention consists of a cloth with two tubes provided on each one of two opposing sides of the cloth, wherein each respective set of two tubes fits within each other and is spring-mounted with respect to each other and is configured for being slide relative to each other, wherein ends of the two tubes are provided with a cap having friction with a window frame, a wall or a rigid object, wherein the mobile sun blind is configured for being clamped in a window frame, between walls, or between rigid objects before a window, if desired, and wherein the mobile sun blind is configured for being quickly and simply rolled up and stored after use, wherein the cloth is rolled on at least one of the sets of tubes.

[0012] An embodiment of mobile sun blind in accordance with the invention consists of a cloth with two tubes provided on each one of two opposing sides of the cloth, wherein each respective set of two tubes fits within each other and is spring-mounted with respect to each other and is configured for being slide relative to each other, wherein the two tubes comprise stainless steal, aluminum or plastic, wherein ends of the two tubes are provided with a cap having friction with a window frame, a wall or a rigid object, wherein the mobile sun blind is configured for being clamped in a window frame, between walls, or between rigid objects before a window, if desired, and wherein the mobile sun blind is configured for being quickly and simply rolled up and stored after use, wherein the cloth is rolled on at least one of the sets of tubes.

[0013] An embodiment of mobile sun blind in accordance with the invention consisting of a cloth with two tubes provided on each one of two opposing sides of the cloth, wherein each respective set of two tubes fits within each other and is spring-mounted with respect to each other and is configured for being slide relative to each other, wherein the two tubes consist of stainless steal, aluminum or plastic, wherein ends of the two tubes are provided with a cap having friction with a window frame, a wall or a rigid object, wherein the mobile sun blind is configured for being clamped in a window frame, between walls, or between rigid objects before a window, if desired, and wherein the mobile sun blind is configured for being quickly and simply rolled up and stored after use, wherein the cloth is rolled on at least one of the sets of tubes.

[0014] An embodiment of mobile sun blind in accordance with the invention consists of a cloth with two tubes provided on each one of two opposing sides of the cloth, wherein each respective set of two tubes fits within each other and is spring-mounted with respect to each other and is configured for being slide relative to each other, wherein the two tubes consist of stainless steel, aluminum or plastic, wherein ends of the two tubes are provided with a rubber cap, wherein the mobile sun blind is configured for being clamped in a window frame, between walls, or between rigid objects before a window, if desired, and wherein the mobile sun blind is configured for being quickly and simply rolled up and stored after use, wherein the cloth is rolled on at least one of the sets of tubes.

[0015] An embodiment of mobile sun blind in accordance with the invention consists of a weather-resistant cloth with two tubes provided on each one of two opposing sides of the cloth, wherein each respective set of two tubes fits within each other and is spring-mounted with respect to each other and is configured for being slide relative to each other, wherein the two tubes consist of stainless steel, aluminum or plastic, wherein ends of the two tubes are provided with a rubber cap, wherein the mobile sun blind is configured for being clamped in a window frame, between walls, or between rigid objects before a window, if desired, and wherein the mobile sun blind is configured for being quickly and simply rolled up and stored after use.

[0016] An embodiment of mobile sun blind in accordance with the invention consists of a weather-resistant cloth with two tubes provided on each one of an upper side and a lower side of the cloth or on each one of a left side and a right side of the cloth, wherein the two tubes fit within each other and are slideable and are spring-mounted relative to each other, wherein the two tubes consist of stainless steel, aluminum or plastic, wherein ends of the two tubes are provided with a rubber cap, wherein the mobile sun blind is configured for being clamped in a window frame, between walls, or between rigid objects before a window, if desired, and wherein the mobile sun blind is configured for being quickly and simply rolled up and stored after use.

[0017] An embodiment of mobile sun blind in accordance with the invention consists of a weather-resistant cloth with two tubes provided on each one of an upper side and a lower side of the cloth or on each one of a left side and a right side of the cloth, wherein the two tubes fit within each other and are slideable and are spring-mounted relative to each other, wherein the two tubes consist of stainless steel, aluminum or plastic, wherein ends of the two tubes are provided with a rubber cap, wherein the object is to be able to clamp the mobile sun blind before each window, if desired, and to quickly and simply roll up and store the mobile sun blind after use.

[0018] An embodiment of mobile sun blind in accordance with the invention further comprises a further set of two tubes, wherein each respective set of two further

tubes fits within each other and is spring-mounted with respect to each other and is configured for being slide relative to each other, wherein ends of the two further tubes are provided with a further cap having friction with the window frame, wherein, in operational use, the further set is to be provided between the sets of two tubes to keep the cloth in a desired shape.

[0019] An embodiment of mobile sun blind in accordance with the invention further comprises a further cloth with two further tubes provided on each one of two opposing sides of the further cloth, wherein each respective set of two further tubes fits within each other and is spring-mounted with respect to each other and is configured for being slide relative to each other, wherein ends of the two further tubes are provided with a further cap having friction with the window frame, the wall or the rigid object, wherein one of the respective sets of further tubes is mechanically coupled to one of the respective sets of tubes.

[0020] An embodiment of mobile sun blind in accordance with the invention further comprises a further weather-resistant cloth with two further tubes provided on each one of an upper side and a lower side of the further cloth or on each one of a left side and a right side of the further cloth, wherein the two further tubes fit within each other and are slideable and are spring-mounted relative to each other, wherein the two further tubes consist of stainless steel, aluminum or plastic, wherein ends of the two further tubes are provided with a further rubber cap, wherein one of the respective sets of further tubes is mechanically coupled to one of the respective sets of tubes, wherein the object is to be able to clamp the mobile sun blind before each window, if desired, and to quickly and simply roll up and store the mobile sun blind after use.

[0021] All embodiments of the mobile sun blind can be combined unless explicitly mentioned otherwise.

[0022] In a second aspect, the invention relates to a method of operating the mobile sun blind in accordance with the invention, the method comprising:

- unrolling the mobile sun blind, and
- clamping the mobile sun blind between a window frame, a wall or a rigid object.

[0023] An embodiment of the method further comprises: i) removing the mobile sun blind from the window frame, the wall, or the rigid object, and ii) rolling up the mobile sun blind.

[0024] An embodiment of the method further comprises: storing the mobile sun blind.

[0025] All embodiments of the method can be combined unless explicitly mentioned otherwise.

[0026] These and other aspects of the invention are apparent from and will be elucidated with reference to the embodiments described hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] In the drawings:

Fig. 1 shows a set of tubes which can be used in the mobile sun blind of the invention;
 Fig. 2 shows a mobile sun blind in accordance with a first embodiment of the invention;
 Fig. 3 shows a mobile sun blind in accordance with a second embodiment of the invention, and
 Fig. 4 shows a mobile sun blind in accordance with a third embodiment of the invention.

List of reference numerals:

[0028]

10	first tube member of set of tubes
10'	first tube member of further set of tubes
11	second tube member of set of tubes
11'	second tube member of further set of tubes
20	spring
30	cap
30'	further cap
40	cloth
40'	further cloth
50	window frame, wall
60	connecting member
100	window
SP	spacing

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0029] Mobile sun blind consisting of a weather-resistant cloth with two tubes provided on each one of an upper side and a lower side of the cloth or on each one of a left side and a right side of the cloth, wherein the two tubes fit within each other and are slideable relative to each other and being spring-mounted relative to each other, wherein the two tubes consist of stainless steel, aluminum or plastic, wherein two tubes are provided with a rubber cap, wherein the object is to be able to clamp the mobile sun blind before each window, if desired.

[0030] In practice it is often unfeasible, superfluous, costly, and on a side facing the street sometimes even legally forbidden to provide all windows with awnings, canopies, and other forms of sun blinds. This mobile sun blind removes all objections because it can be unrolled and clamped between window frames, walls or other rigid objects, at any desired moment in time, and after use it can be quickly rolled up and stored again. Because of the fact that this sun blind can also be applied on the inside of a window, it is also suitable for locations on the outside which are difficult or impossible to reach.

[0031] The invention relates to a mobile sun blind consisting of a weather-resistant cloth with two tubes provided on each one of an upper side and a lower side of the cloth or on each one of a left side and a right side of the cloth, wherein the two tubes fit within each other and are slideable and are spring-mounted relative to each other, wherein the two tubes consist of stainless steel, aluminum

or plastic, wherein ends of the two tubes are provided with a rubber cap, wherein the object is to be able to clamp the mobile sun blind before each window, if desired, and to quickly and simply roll up and store the mobile sun blind after use.

[0032] In order to facilitate the discussion of the detailed embodiments a few expressions are defined hereinafter.

[0033] Throughout this description the term "physical attaching" should be interpreted as to include all forms of attaching, such as gluing, sewing, nailing, screwing, bonding, etc.

[0034] Throughout this description the term "mechanical coupling" should be interpreted as providing any kind of connecting member between two parts.

[0035] Fig. 1 shows a set of tubes which can be used in the mobile sun blind of the invention. The set comprises a first tube member 10 and a second tube member 11 (forming a set of tubes) which fit into each other and are slideable with respect to each other. A spring 20 is provided in the second tube member 11 such that the members can be moved under spring force (spring-mounted). Means may be provided to prevent the members to be completely separated from each other. On both ends of the set of tubes there is provided a cap 30. This cap may comprise rubber, or any other suitable material having enough friction with a window frame, a wall or a rigid object between which the set of tubes is to be placed. The total length of the set of tubes including the caps 30 has to be larger than the space between the window frame, walls or rigid objects in which it has to be placed. Placement is done by pressing the tube members 10, 11 in each other and releasing the tube members when the set of tubes is in the right position and orientation. The friction between the caps 30 and the window frame, wall, or rigid object will ensure that the position and orientation is fixed. The dimensions of the set of tubes are dependent on the dimensions of the window frame, the dimensions between the walls before a window, or the dimension between the rigid objects. The length may be typically in the range from 400mm to 3000mm. The diameter of the tube members determines the strength of the set of tubes. The diameter may be typically in the range from 10mm to 40mm. Materials of the tube members may be any firm material, such as stainless steel, aluminum, plastic, PVC. However, also other materials are possible.

[0036] It is also possible to use a set of tubes having more than two tube members, for example three. In such embodiment there may be a middle tube member (not shown) and two outer tube members. One or two springs may be provided in the middle tube members for example.

[0037] Fig. 2 shows a mobile sun blind in accordance with a first embodiment of the invention. The sun blind has been placed between walls 50 around a window 100. Alternatively, it is also possible to place the sun blind between a window frame (not shown) or any other rigid object in the vicinity of the window 100. The sun blind

comprises two sets of tubes 10, 11 as illustrated in Fig. 1 between which a cloth 40 is provided. The cloth 40 is preferably made of a weather-resistant material. The dimensions of the cloth have to be matched with the length of the sets of tubes 10, 11 and the window 100. After use, the cloth can be rolled on one of the sets of tubes 10, 11 or on both. The friction of caps 30 with the walls 50 ensures that the cloth 40 can be kept tense in operational use.

[0038] In an embodiment fixation means are provided on the sets of tubes 10, 11 to keep the cloth in place. This functionality may also be provided by the rubber caps 30.

[0039] When the surface of the walls 50 around the window is very rough, it may be beneficial to mount angle steels on the walls 50 onto which the caps 30 are placed.

[0040] In an example embodiment the length of the first tube members 10 is 1670mm and the diameter of the first tube members 10 is 15mm. The length of the second tube members 11 is 1670mm and the diameter of the second tube member 11 is 20mm. This embodiment is suitable for being placed before a window 100 having a dimension of 2100mm by 1770mm. The cloth 40 has a dimension of 2090mm by 1690mm.

[0041] Fig. 3 shows a mobile sun blind in accordance with a second embodiment of the invention. This figure is discussed in as far as it differs from Fig. 2. This embodiment is advantageous in situations where the window is very wide and in situations where the window 100 is not straight, but follows a corner or is curved. The embodiment effectively comprises in this example two sun blinds as discussed in Fig. 2, which are connected together by means of connecting members 60. To this end a further cloth 40' is provided having further sets of tubes 10', 11' with further caps 30' similar to Fig. 2. This configuration features bending of the sun blind at the location of the sets of tubes 10, 11, 10', 11' in the middle of the sun blind. In an alternative embodiment the connecting members 60 are left out. Proper dimensioning of the caps 30, 30' ensures that the spacing SP between the cloth 40 and the further cloth 40' can be kept minimal. The embodiment of Fig. 3 can be expanded to any number of sun blinds in series.

[0042] Fig. 4 shows a mobile sun blind in accordance with a third embodiment of the invention. This figure is discussed in as far as it differs from Figs. 2 and 3. Instead of connecting multiple sun blinds in series it is also possible to provide a further set of tubes 10', 11' somewhere in the middle of the cloth 40. Around the further set of tubes 10', 11' the cloth 40 can bend to have any desired shape in conformity with the window. When it is placed behind the cloth, for example, it also can be used to put the cloth 40 under more tensile strain, which reduces the sensitivity of the sun blind for wind.

[0043] The further set of tubes 10', 11' can be a separate part, but it may also be provided with guiding means for the cloth 40, such as a groove, slot, slit, or a notch. Alternatively, it can be a double set of tubes, wherein one

is provided at a front-side and one is provided at a back-side of the cloth 40.

[0044] In the embodiments discussed in Figs. 1 to 4, many variations are possible. The possibilities and variations described here are not exhaustive, but are for illustration purposes only.

[0045] The invention thus provides a mobile sun blind comprising a cloth comprising two tubes provided on each one of two opposing sides of the cloth. Each respective set of two tubes fits within each other and is spring-mounted with respect to each other and is configured for being slide relative to each other. Ends of the two tubes are provided with a cap having friction with a window frame, a wall or a rigid object. The mobile sun blind is configured for being clamped in a window frame, between walls, or between rigid objects before a window, if desired, and wherein the mobile sun blind is configured for being quickly and simply rolled up and stored after use, wherein the cloth is rolled on at least one of the sets of tubes. The advantage of the mobile sun blind of the invention is that the window frame, wall or rigid object is not damaged when the mobile sun mounted. The invention further provides a method of operating such a sun blind.

[0046] The invention can be applied outdoor and indoor. The latter is particularly interesting in case the outdoor location is difficult or impossible to reach.

[0047] Various variations of the sun blind in accordance with the invention are possible and do not depart from the scope of the invention as claimed. These variations for example relate to material choice for the tubes, material choice for the cloth, material choice for the cap, tube dimensions, cloth dimensions, the number of tubes, and the number of clothes.

[0048] It should be noted that the above-mentioned embodiments illustrate rather than limit the invention, and that those skilled in the art will be able to design many alternative embodiments without departing from the scope of the appended claims. In the claims, any reference signs placed between parentheses shall not be construed as limiting the claim. Use of the verb "comprise" and its conjugations does not exclude the presence of elements or steps other than those stated in a claim. The article "a" or "an" preceding an element does not exclude the presence of a plurality of such elements. The invention may be implemented by means of hardware comprising several distinct elements. In the device claim enumerating several means, several of these means may be embodied by one and the same item of hardware. The mere fact that certain measures are recited in mutually different dependent claims does not indicate that a combination of these measures cannot be used to advantage. Throughout the Figures, similar or corresponding features are indicated by same reference numerals or labels.

Claims

1. A mobile sun blind comprising a cloth (40) comprising two tubes (10, 11) provided on each one of two opposing sides of the cloth (40), wherein each respective set of two tubes (10, 11) fits within each other and is spring-mounted with respect to each other and is configured for being slide relative to each other, wherein ends of the two tubes (10, 11) are provided with a cap (30) having friction with a window frame, a wall or a rigid object, wherein the mobile sun blind is configured for being clamped in a window frame (50), between walls, or between rigid objects before a window, if desired, and wherein the mobile sun blind is configured for being quickly and simply rolled up and stored after use, wherein the cloth (40) is rolled on at least one of the sets of tubes (10, 11).
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2. A mobile sun blind consisting of a cloth (40) with two tubes (10, 11) provided on each one of two opposing sides of the cloth (40), wherein each respective set of two tubes (10, 11) fits within each other and is spring-mounted with respect to each other and is configured for being slide relative to each other, wherein ends of the two tubes (10, 11) are provided with a cap (30) having friction with a window frame (50), a wall or a rigid object, wherein the mobile sun blind is configured for being clamped in a window frame (50), between walls, or between rigid objects before a window, if desired, and wherein the mobile sun blind is configured for being quickly and simply rolled up and stored after use, wherein the cloth (40) is rolled on at least one of the sets of tubes (10, 11).
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3. A mobile sun blind consisting of a cloth (40) with two tubes (10, 11) provided on each one of two opposing sides of the cloth (40), wherein each respective set of two tubes (10, 11) fits within each other and is spring-mounted with respect to each other and is configured for being slide relative to each other, wherein the two tubes (10, 11) comprise stainless steal, aluminum or plastic, wherein ends of the two tubes (10, 11) are provided with a cap (30) having friction with a window frame (50), a wall or a rigid object, wherein the mobile sun blind is configured for being clamped in a window frame (50), between walls, or between rigid objects before a window, if desired, and wherein the mobile sun blind is configured for being quickly and simply rolled up and stored after use, wherein the cloth (40) is rolled on at least one of the sets of tubes (10, 11).
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4. A mobile sun blind consisting of a cloth (40) with two tubes (10, 11) provided on each one of two opposing sides of the cloth (40), wherein each respective set of two tubes (10, 11) fits within each other and is spring-mounted with respect to each other and is configured for being slide relative to each other,
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- wherein the two tubes (10, 11) consist of stainless steal, aluminum or plastic, wherein ends of the two tubes (10, 11) are provided with a cap (30) having friction with a window frame (50), a wall or a rigid object, wherein the mobile sun blind is configured for being clamped in a window frame (50), between walls, or between rigid objects before a window, if desired, and wherein the mobile sun blind is configured for being quickly and simply rolled up and stored after use, wherein the cloth (40) is rolled on at least one of the sets of tubes (10, 11).
5. A mobile sun blind consisting of a cloth (40) with two tubes (10, 11) provided on each one of two opposing sides of the cloth (40), wherein each respective set of two tubes (10, 11) fits within each other and is spring-mounted with respect to each other and is configured for being slide relative to each other, wherein the two tubes (10, 11) consist of stainless steal, aluminum or plastic, wherein ends of the two tubes (10, 11) are provided with a rubber cap (30), wherein the mobile sun blind is configured for being clamped in a window frame (50), between walls, or between rigid objects before a window, if desired, and wherein the mobile sun blind is configured for being quickly and simply rolled up and stored after use, wherein the cloth (40) is rolled on at least one of the sets of tubes (10, 11).
6. A mobile sun blind consisting of a weather-resistant cloth (40) with two tubes (10, 11) provided on each one of two opposing sides of the cloth (40), wherein each respective set of two tubes (10, 11) fits within each other and is spring-mounted with respect to each other and is configured for being slide relative to each other, wherein the two tubes (10, 11) consist of stainless steal, aluminum or plastic, wherein ends of the two tubes (10, 11) are provided with a rubber cap (30), wherein the mobile sun blind is configured for being clamped in a window frame (50), between walls, or between rigid objects before a window, if desired, and wherein the mobile sun blind is configured for being quickly and simply rolled up and stored after use.
7. A mobile sun blind consisting of a weather-resistant cloth (40) with two tubes (10, 11) provided on each one of an upper side and a lower side of the cloth (40) or on each one of a left side and a right side of the cloth (40), wherein the two tubes (10, 11) fit within each other and are slideable and are spring-mounted relative to each other, wherein the two tubes (10, 11) consist of stainless steal, aluminum or plastic, wherein ends of the two tubes (10, 11) are provided with a rubber cap (30), wherein the object is to be able to clamp the mobile sun blind before each window, if desired, and to quickly and simply roll up and store the mobile sun blind after use.

8. The mobile sun blind as claimed in any one of the preceding claims, further comprising a further set of two tubes (10, 11), wherein each respective set of two further tubes (10', 11') fits within each other and is spring-mounted with respect to each other and is configured for being slide relative to each other, wherein ends of the two further tubes (10', 11') are provided with a further cap (30') having friction with the window frame (50), wherein, in operational use, the further set is to be provided between the sets of two tubes (10, 11) to keep the cloth (40) in a desired shape. 5 10
9. The mobile sun blind as claimed in any one of claims 1 to 7, further comprising a further cloth (40') with two further tubes (10', 11') provided on each one of two opposing sides of the further cloth (40'), wherein each respective set of two further tubes (10', 11') fits within each other and is spring-mounted with respect to each other and is configured for being slide relative to each other, wherein ends of the two further tubes (10', 11') are provided with a further cap (30') having friction with the window frame (50), the wall or the rigid object, wherein one of the respective sets of further tubes (10', 11') is mechanically coupled to one of the respective sets of tubes (10, 11, 10', 11'). 15 20 25
10. Method of operating the mobile sun blind as claimed in any one of the preceding claims, the method comprising: 30
- unrolling the mobile sun blind, and
 - clamping the mobile sun blind between a window frame (50), a wall or a rigid object. 35
11. The method as claimed in claim 10, further comprising: 40
- removing the mobile sun blind from the window frame (50), the wall, or the rigid object, and
 - rolling up the mobile sun blind. 45
12. The method as claimed in claim 11, further comprising storing the mobile sun blind. 50 55

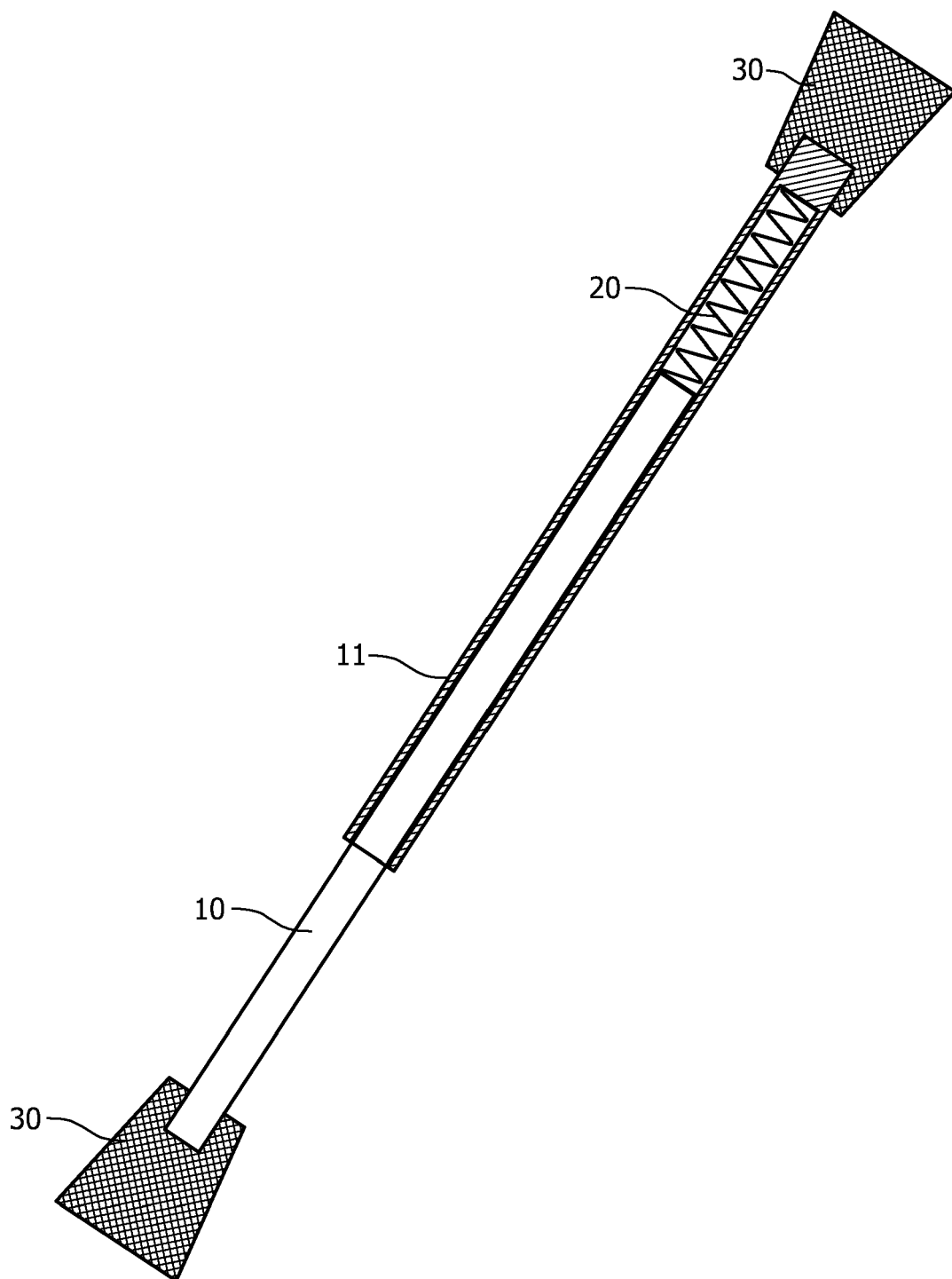


FIG. 1

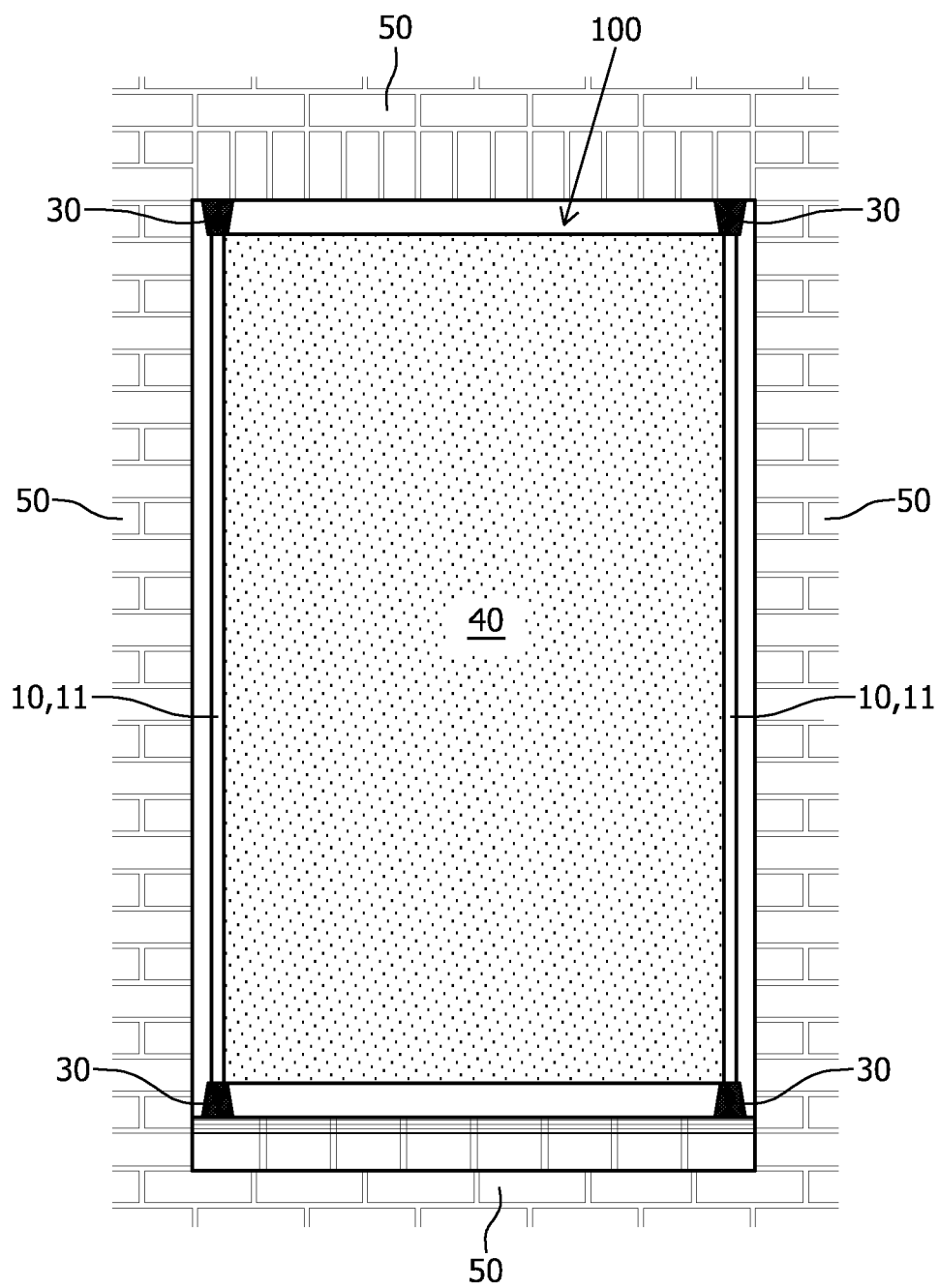


FIG. 2

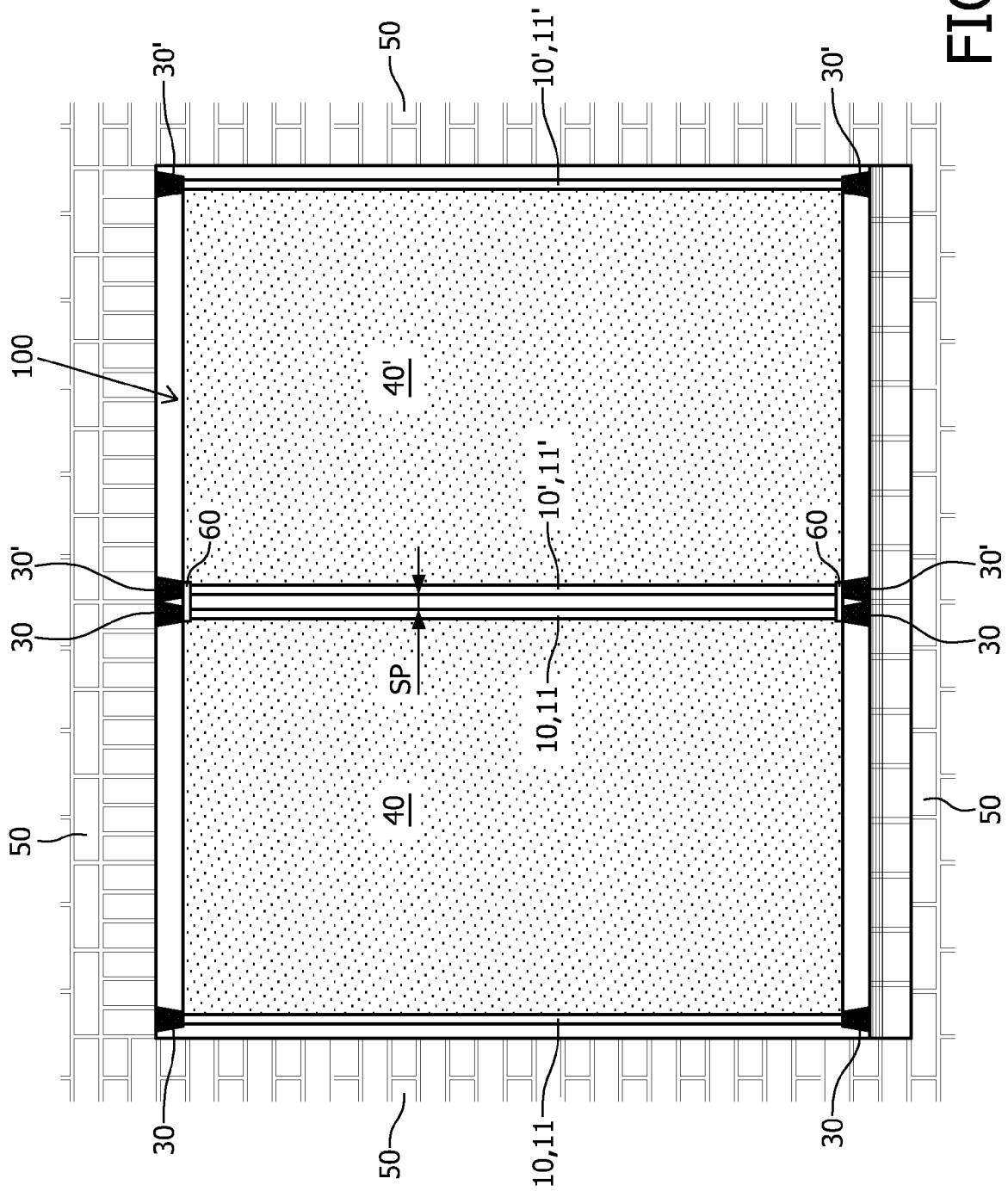


FIG. 3

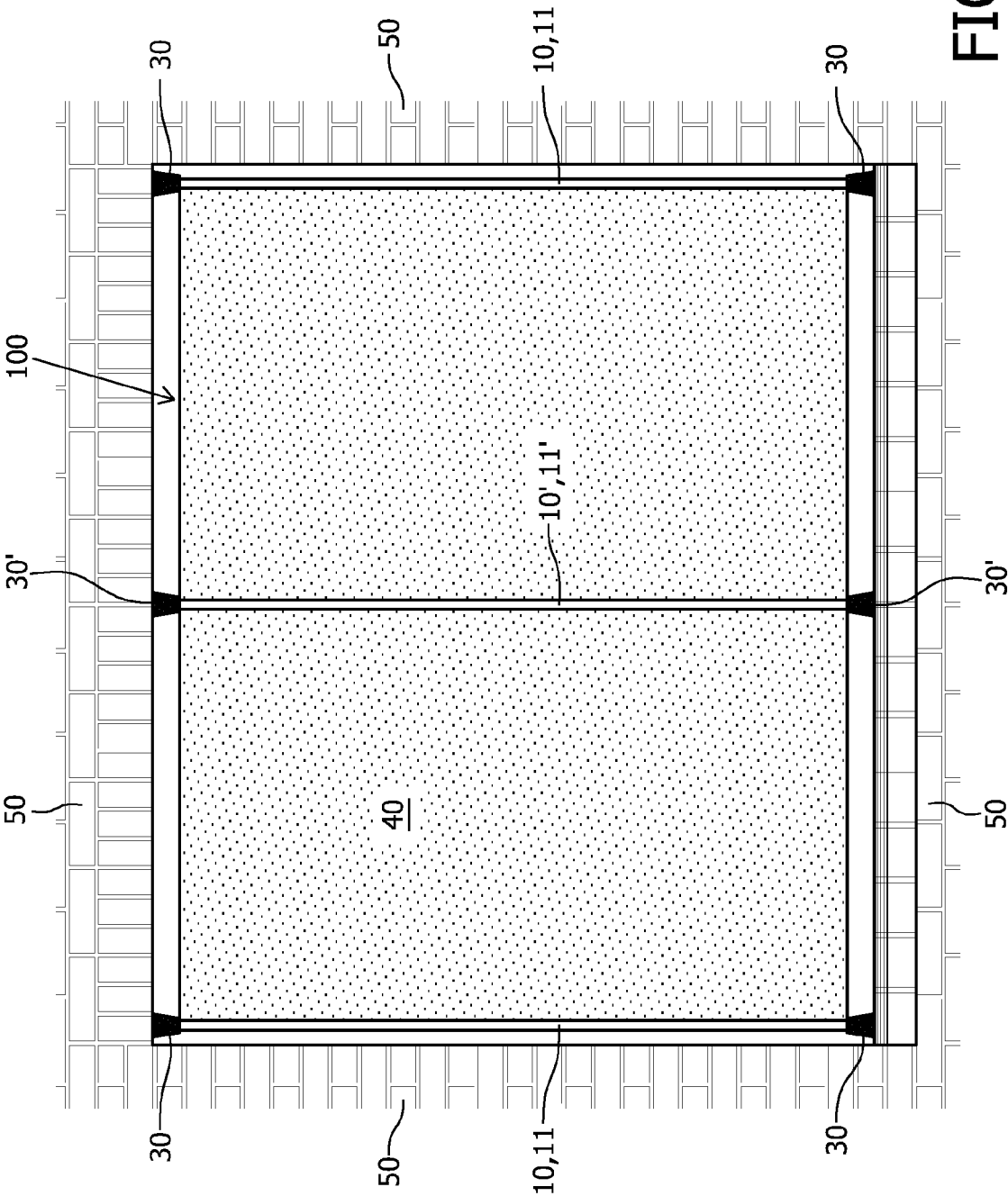


FIG. 4

REFERENCES CITED IN THE DESCRIPTION

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