



(11) **EP 4 509 019 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
19.02.2025 Bulletin 2025/08

(51) International Patent Classification (IPC):
A47C 23/05^(2006.01) A47C 27/07^(2006.01)

(21) Application number: **23192139.6**

(52) Cooperative Patent Classification (CPC):
A47C 23/05; A47C 27/07

(22) Date of filing: **18.08.2023**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL
NO PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

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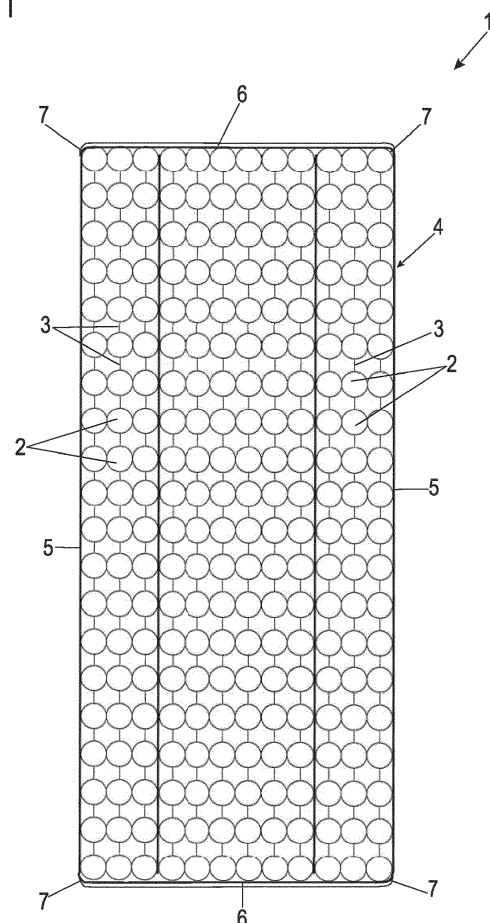
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(54) **SPRING CORE**

(57) A spring core (1) for the manufacture of mattresses or upholstered furniture comprises a plurality of springs arranged in rows (2) and a frame made of strip steel (4), which surrounds a surface with springs (2) and is fixed to at least one part of the springs (2), wherein the strip steel has a different inclination on at least two sides of the frame (4). As a result, the strip steel has different rigidity on different sides, which improves the handling of the spring core (1) for transport, storage and use.

Fig. 1



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Description

[0001] The present invention relates to a spring core for the production of mattresses or upholstered furniture, having a plurality of springs arranged in rows and a frame made of strip steel, which surrounds a surface with springs and is fixed at least on a part of the springs.

[0002] From US 3,142,071 a spring core is known in which a frame-shaped edge reinforcement is formed by a wire which is connected to the respective outer springs of the spring core. Although the use of a frame made of a round wire improves stiffness at the edge, these wires are not suitable for roll packaging and it is difficult to roll up such reinforced spring cores for a small transport volume. The frame made of the wire is therefore often only attached to the customer after the spring cores have been unrolled, which is comparatively complex.

[0003] To reinforce an edge of a spring core, it is also known from DE 16 54 319 to provide a strip steel of a flat material to form an edge and to strengthen the spring core at the edge. Here, too, there is the problem that such a spring core either has a low stiffness at the edge due to a thin strip steel or is difficult to roll up and unroll.

[0004] It is therefore an object of the present invention to create a spring core which has an improved edge reinforcement and can be wound up for transport.

[0005] This object is achieved with a spring core having the features of claim 1.

[0006] The spring core according to the invention comprises a frame of a strip steel which has a different inclination on at least two sides of the frame. As a result, the steel strip can be optimally aligned to allow compression of the spring core and rolling up in one direction, while on another side increased rigidity is achieved by a different orientation of the steel strip.

[0007] Preferably, the frame has two long sides and two front sides, wherein the orientation of the strip steel is the same on the two long sides. Optionally, in addition or alternatively, the orientation of the strip steel on the two end sides can be the same, wherein the length of the long sides is preferably longer than on the end sides, but these can optionally also be of the same length. As a result, the spring core can be wound up more easily over the long side or the front side, but increased rigidity is provided on the other side. Preferably, the stiffness of the strip steel is greater on the long sides than on the front sides, since the long sides are more often loaded by a user during use.

[0008] The strip steel preferably has a twist on at least one corner area. Such twisting changes the orientation of the steel strip by one axis in the longitudinal direction of the steel strip. This twisting can rotate the strip steel by at least 80°, preferably the strip steel is rotated on different sides of the twist by about 90°. The twisting does not have to be arranged exactly in the bent corner area of the strip steel, but can also be provided adjacent to the bend in a corner area to facilitate the production of the bent corner area.

[0009] The frame is preferably bent from a single sec-

tion of a strip steel connected at opposite ends to make the frame from one part. Alternatively, the frame may also have a plurality of sections of a steel strip that are connected to each other, for example by welding, gluing or mechanical fasteners.

[0010] The strip steel is preferably rectangular in cross-section. In this case, the width of the strip steel may be in a range of 2.5 to 15 mm, in particular 5 mm to 12 mm, while the height is between 1.2 to 1.8 mm, in particular 1.3 to 1.6 mm. As a result, the strip steel is designed to be bendable and windable around the height, while the larger width ensures rigidity in the corresponding direction. The terms "width" and "height" do not refer to the orientation of the strip steel, but only to the dimensions related to the rectangular cross-section. Depending on the arrangement of the strip steel, the height can therefore be measured horizontally, vertically or in a different spatial direction.

[0011] The strip steel is preferably connected to springs via several clamps. The strip steel can be fixed circumferentially on all outer springs with a clamp or other fastening means. For sufficient fixation, the frame can also be attached to only a part of the outer springs.

[0012] The outer boundary of the spring core is preferred for the connection to the strip steel. The springs can be formed as pocket springs, Bonell springs or as LFK springs, whereby different types of springs can be combined with each other. Optionally, a series of springs outside the frame can also be provided.

[0013] Preferably, a single frame may be provided on the spring core. This single frame can be fixed, for example, centrally on the springs. Alternatively, several frames can be arranged at different heights around the spring core, for example, a frame is arranged at the bottom and a frame at the top of the spring core. The frame can also be positioned depending on the spring type, either in the middle, at the top or at the bottom of the spring core.

[0014] Such a spring core is preferably used for the production of a mattress or upholstered furniture.

[0015] The invention is explained in more detail below by means of an embodiment with reference to the attached drawings. It shows:

Figure 1 is a top view of a spring core according to the invention, and

Figure 2 is a detailed view of a corner area of the spring core of Figure 1.

[0016] A spring core 1 comprises a plurality of springs connected along rows and joined together to form a rectangular or square composite in plan view. The springs 2 are connected via schematically represented connecting means 3 to strands, wherein the springs are formed as pocket springs, Bonell springs, LFK springs with the same or different spring zones.

[0017] The unit of springs 2 is surrounded by a frame 4,

which is formed by a circumferential strip steel. The frame 4 comprises two long sides 5 and two front sides 6. The strip steel is formed from a single section which is connected at the two ends, optionally the strip steel of frame 4 may also be formed from a plurality of composite sections.

[0018] At the end sides 6, the strip steel is arranged with the flat surface upwards, so that on the front sides 6 the frame 4 has a larger width than on the long sides 5 in plan view. On the long sides 5, the strip steel is arranged rotated by about 90°, so that the flat side is aligned in the vertical direction parallel to the direction of action of the spring 2. In the corner areas of the frame 4, a twist 7 is provided, which is arranged in the region of a spring in the corner region or adjacent to it, so that the frame 4 has a different stiffness in the vertical direction on the long sides 5 and the front sides 6.

[0019] Preferably, the stiffness of the strip steel is greater on the long sides 5, so that the edge reinforcement is increased, in this area the users usually sit at the edge. On the front sides, however, the stiffness in the vertical direction is lower due to the rotated arrangement of the strip steel, since at the end sides 6 there is usually less of a seat load. This twisting of the strip steel results in different stiffnesses, and the spring core 1 shown can thus be more easily unwound and unwound for transport. For example, the springs 2 can be compressed in the direction of action and then wound around an axis parallel to the longitudinal side 5. Optionally, the turned arrangement of the strip steel can also be designed differently, so that winding around an axis parallel to the front side 6 is possible.

[0020] In Figure 2, a corner area of the spring core 1 is shown, on which the strip steel of the frame 4 is rotated along the twist 7 about 90°. The strip steel is connected at the front side 6 via brackets 8 with a spring 2, wherein the clamp engages both the strip steel 4 and the wire of the spring 2. The strip steel is curved in the area of the spring 2 in the corner area and fixed on two sides of the spring 2 with a clamp 8 each. Behind the second bracket, the twist 7 is then arranged, with which the strip steel is rotated by 90°, so that it is vertically aligned along the long side 5. Also on the long sides, the strip steel is connected via brackets 8 with the respective outer springs 2.

[0021] In the embodiments shown, two frames 4 are provided, a frame 4 at the bottom of the spring core 1 and a frame 4 at the top. It is of course possible to provide only a single frame 4, which is arranged either below, above or in a middle area. In addition, more than two frames 4 can be fixed to the springs 2.

[0022] In the embodiment shown, the fixing of the frame 4 is carried out via metallic brackets 8. It is also possible to choose other fasteners. In addition, the attachment to the springs 2 can also be done to the surrounding nonwoven material if the springs 2 are arranged in pockets of non-woven fabric.

[0023] The strip steel for frame 4 is rectangular in cross-section and preferably has a width between 2.5

mm to 15 mm and a height between 1.2 mm to 1.8 mm. The steel material can be unalloyed carbon steel or alloyed steel such as stainless steel. The strip steel can be produced by flattening a steel wire or other suitable methods for producing a strip steel with a rectangular cross-section. The cross-section does not necessarily have to be exact a rectangular, it could be slightly shaped such as oval, dumbbell-shaped, kidney.

[0024] In the embodiment shown only one twist is arranged at each edge portion. However, it is possible to provide multiple twists at each edge portion, too.

List of reference signs

[0025]

- 1 spring core
- 2 spring
- 3 connecting means
- 4 Frames
- 5 Longitudinal side
- 6 Front
- 7 Twisting
- 8 Bracket

Claims

1. Spring core (1) for the manufacture of mattresses or upholstered furniture, with a plurality of springs arranged in rows (2) and a frame made of strip steel (4), which surrounds a surface with springs (2) and is fixed at least on a part of the springs (2), **characterized in that** the strip steel has a different inclination on at least two sides of the frame (4).
2. Spring core according to claim 1, **characterized in that** the frame (4) has two long sides (5) and two front sides (6) and the orientation of the strip steel on the two long sides (5) is the same.
3. Spring core according to claim 2, **characterized in that** the orientation of the strip steel at the front sides (6) is the same.
4. Spring core according to any one of the preceding claims, **characterized in that** the strip steel has a twist (7) at least one corner region.
5. Spring core according to claim 4, **characterized in that** the twist (7) is rotated by at least 80°.
6. Spring core according to any one of the preceding claims, **characterized in that** the strip steel is aligned on the at least two sides substantially perpendicular to each other.
7. Spring core according to any one of the preceding claims, **characterized in that** the frame (4) is bent

from a single section of a steel strip.

8. Spring core according to any one of the preceding claims, **characterized in that** the strip steel is rectangular in cross-section. 5
9. Spring core according to any one of the preceding claims, **characterized in that** the strip steel has a width of 2.5 to 15 mm. 10
10. Spring core according to any one of the preceding claims, **characterized in that** the strip steel has a height between 1.2 to 1.8 mm. 15
11. Spring core according to any one of the preceding claims, **characterized in that** the strip steel is connected via a plurality of brackets (8) to springs (2). 20
12. Spring core according to any one of the preceding claims, **characterized in that** the springs (2) are formed as pocket springs, Bonell springs or as LFK springs. 25
13. Spring core according to any one of the preceding claims, **characterized in that** around the surface of springs (2) several frames (4) are arranged at different heights. 30
14. Mattress with a spring core (1) according to one of the preceding claims. 35

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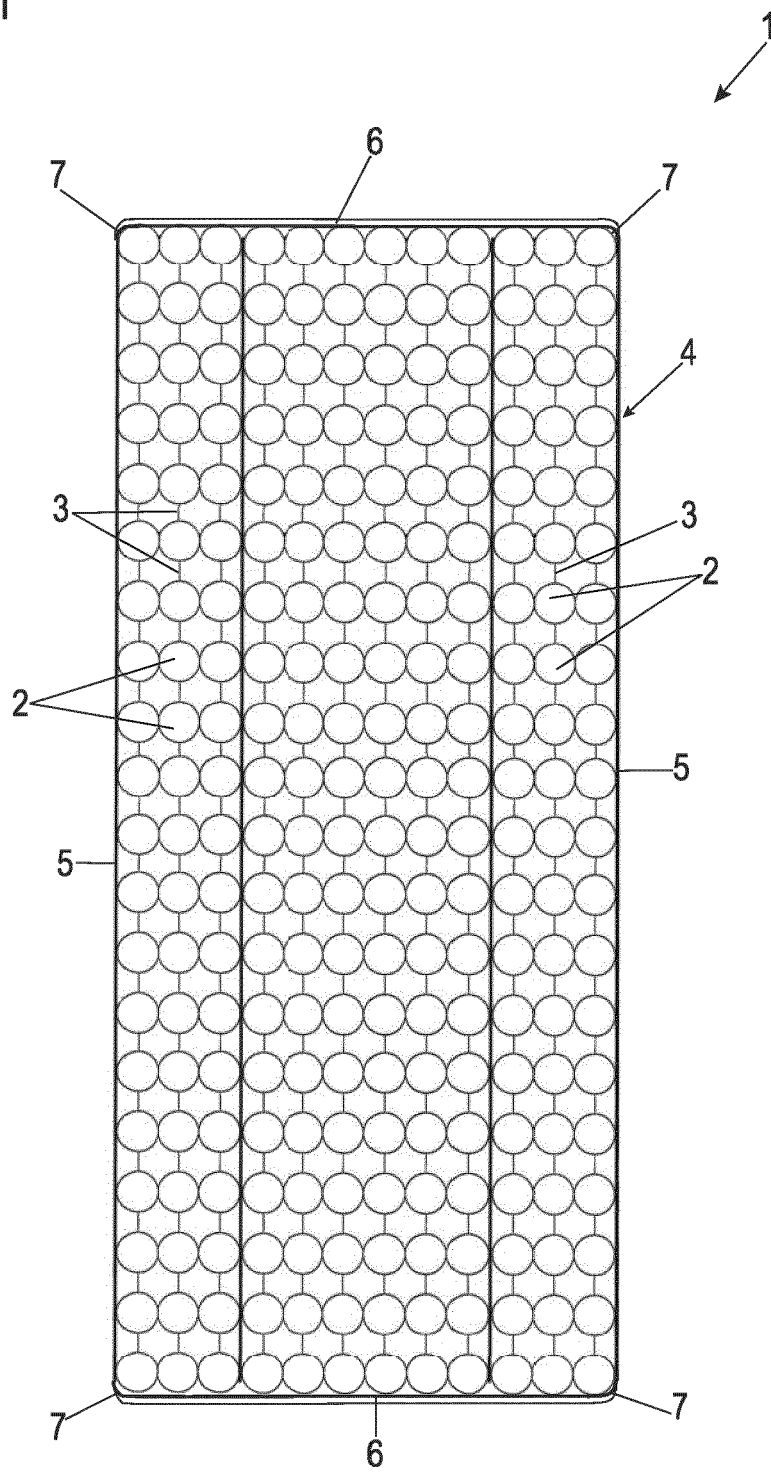
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Fig. 1



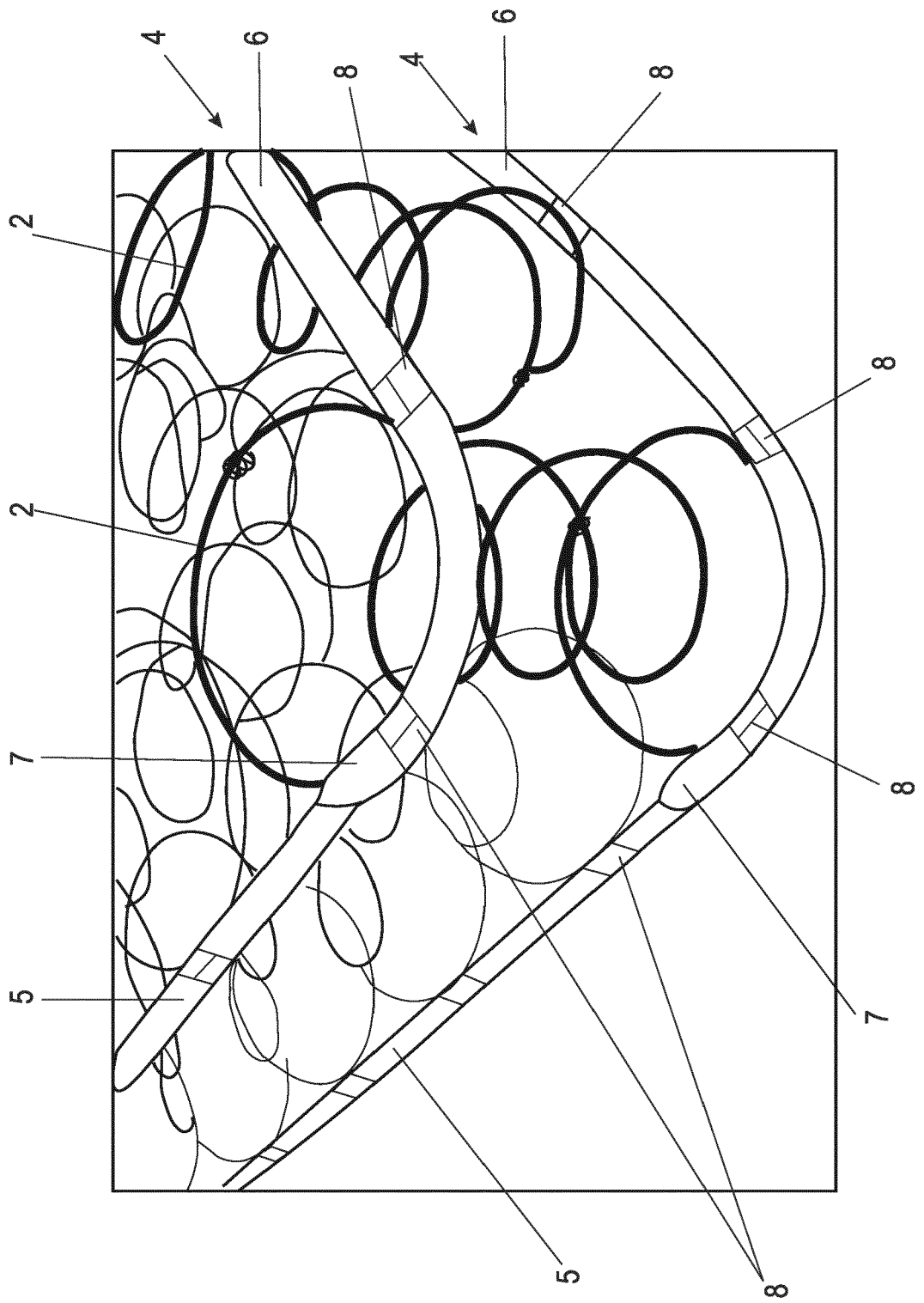


Fig. 2



EUROPEAN SEARCH REPORT

Application Number

EP 23 19 2139

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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		15 January 2024	Linden, Stefan
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
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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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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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