



(11) **EP 3 939 905 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
19.01.2022 Bulletin 2022/03

(51) International Patent Classification (IPC):
B65D 65/40 ^(2006.01) **B65D 81/03** ^(2006.01)

(21) Application number: **20186032.7**

(52) Cooperative Patent Classification (CPC):
B65D 81/03; B65D 65/406

(22) Date of filing: **15.07.2020**

(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 MK MT NL NO
PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

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(54) **AN EMBOSSED CUSHIONING MATERIAL FOR WRAPPING AN ARTICLE**

(57) An embossed cushioning material (10) for wrapping an article comprises at least a first material layer (12) having a plurality of punctual embossed protrusions (16). The invention proposes that the cushioning material

(10) comprises at least a second material layer (14), wherein at least one property of the second material layer (14) is different from the corresponding property of the first material layer (12).

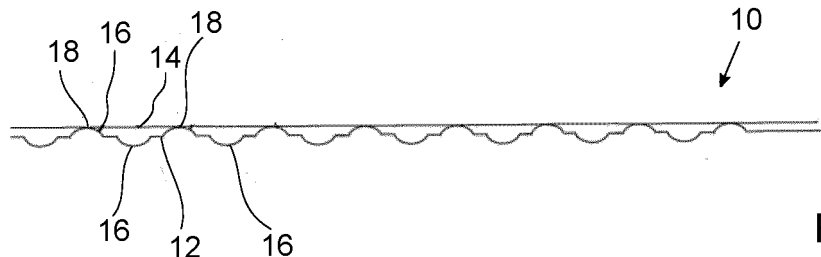


FIG.1

Description

[0001] The invention relates to an embossed cushioning material for wrapping an article according to the preamble of claim 1.

[0002] It is known to protect objects to be transported or shipped from impacts or other harmful external influences by wrapping these objects with a cushioning material. Such a protective cushioning material can be, for example, a bubble wrap made of plastic, or another three-dimensional cushioning material, which for example has bulges similar to an egg carton.

[0003] International patent publication WO 2019/020631 A1 discloses a cushioning paper material for packaging purposes having a cushioning portion comprising a plurality of convex protrusions and concave recesses. Similar cushioning materials are disclosed in DE 1 894 663 U, DE 1 675 907 U, and US 3 288 353 A.

[0004] It is an object of the present invention to provide an embossed cushioning material having superior properties.

[0005] The above-mentioned and other objects are achieved by means of an embossed cushioning material having the features of the independent claim. Advantageous further embodiments are described in dependent claims.

[0006] The embossed cushioning material according to the invention is a two-layer material therefore allowing to combine different properties of each of the material layers and therefore to create a cushioning material which is specifically adapted to specific wrapping and protection needs. More specifically, the invention proposes an embossed cushioning material for wrapping an article in order to protect the article from harmful external influences during shipping, storage and/or transport, and particularly to protect the article from shock loads.

[0007] The inventive cushioning material comprises at least a first material layer having a plurality of embossed and essentially punctual protrusions in the form of solitary protuberances which are essentially uniformly distributed in both dimensions of the plane of the first material layer. This means that the first material layer is a functional and three-dimensional layer providing a desired cushioning property. The term "three-dimensional" indicates that the embossed protrusions of the first and generally rather thin layer provide a distinctive thickness to the first layer creating the elasticity in the thickness direction which is necessary for the required protective cushioning properties. The embossed protrusions may be formed as relatively small and essentially punctual bulges similar to those of an egg carton. Furthermore, the inventive cushioning material comprises at least a second material layer, wherein at least one property of the second material layer is different from the corresponding property of the first material layer. The term "property" is to be understood in a broad sense covering chemical, physical and geometrical properties.

[0008] In a further embodiment, the second material

layer is, taken as a whole, substantially parallel to the first material layer and regionally joined to the first material layer. The expression "regionally joined" indicates that the second material layer does not laminary adhere to the first material layer but rather is connected to the first material layer in distinct regions which in the plane of the cushioning material are distant to each other. Additionally, the second material layer is "taken as a whole" substantially parallel to the first material layer which indicates that the second material layer does not exactly follow the shape of the first material layer with all its protrusions but rather acts as a kind of cover over the first material layer which makes that the second material layer is regionally distant from the first material layer. This means that the second material layer is applied to the first material layer only after the protrusions have been embossed. Such a cushioning material has particularly preferred properties because the first material layer is not visible at least when seen from that side where the second material layer is present.

[0009] In a further embodiment the second material layer is essentially flat. This allows to create a cushioning material having at least on one side an essentially flat outer surface providing advantageous haptic properties.

[0010] In a further embodiment the first material layer is a functional layer providing the required cushioning properties and the second material layer is at least also an optical layer providing a desired optical property. By way of example, the second material layer may be made from a colored material or may have graphics on its outer surface, for example a company logo, use instructions, or the like. This enhances customer acceptance.

[0011] In a further embodiment the second material layer additionally provides a cushioning property, which further improves the total cushioning performance of the inventive cushioning material.

[0012] In a further embodiment the second material layer comprises a plurality of embossed protrusions, the density of protrusions per area of the second material layer being different from the density of protrusions per area of the first material layer. The second material layer thus may act as an outer surface cushioning means which does not only protect the wrapped object but also the first material layer.

[0013] In a further embodiment the density of protrusions per area of the second material layer is higher than the density of protrusions per area of the first material layer and wherein at least one dimension of the protrusions of the second material layer is lower than the corresponding dimension of the protrusions of the first material layer. By consequence, the outer surface presented by the second material layer has an increased smoothness compared to the first material layer.

[0014] In a further embodiment the second material layer comprises a foam material. This is an alternative cushioning material which can easily be manufactured.

[0015] In a further embodiment the first material layer is made from paper, preferably from craft paper, more

preferably from recycled kraft paper. Paper has essential ecological advantages.

[0016] In a further embodiment the second material layer is made from paper, preferably from colored paper. Again, paper has essential ecological advantages.

[0017] In a further embodiment it is formed as a sheet, preferably a rectangular sheet. A sheet type cushioning material is particularly easy to use. Other preferable shapes are circular, triangular and oval.

[0018] In a further embodiment the cushioning material comprises at least one line of weakened material strength, preferably a perforation line, allowing to separate a portion of the cushioning material from the remainder along the line. This allows to easily and manually adapt the dimensions of the cushioning material to the specific cushioning and wrapping needs without additional tools being required.

[0019] In a further embodiment the cushioning material comprises a third material layer which, taken as a whole, is substantially parallel to the first material layer and regionally joined to the first material layer, and wherein the first material layer is sandwiched between the second and the third material layer. Such a cushioning material may have inner and outer surfaces specifically adapted to improve the handling properties during wrapping and unwrapping and/or the cushioning properties and/or the optical and other properties.

[0020] The invention now will be described with reference to the attached drawing. In the drawing is

- Figure 1 a schematic sectional view of a first embodiment of an embossed cushioning material;
- Figure 2 a view similar to figure 1 of a second embodiment;
- Figure 3 a view similar to figure 1 of a third embodiment;
- Figure 4 a view similar to figure 1 of a fourth embodiment;
- Figure 5 a view similar to figure 1 of a fifth embodiment; and
- Figure 6 a schematic perspective view of the second embodiment of figure 2.

[0021] It is to be noted that for the sake of clarity in the figures only exemplary but not all elements and portions or regions are designated with reference signs. Furthermore, functionally equivalent elements and portions are designated with the same reference signs in different embodiments, and in the description of subsequent embodiments only the differences to previous embodiments will be explained in detail.

[0022] In the figures, a cushioning material for wrapping an article is generally designated with reference sign

10. The cushioning material 10 comprises at least a first material layer 12 and a second material layer 14. The first material layer 12 comprises a plurality of embossed protrusions 16. Therefore, the cushioning material 10 may be called an embossed cushioning material, although the second layer 14 does not have any embossed protrusions.

[0023] The embossed protrusions 16 of the first material layer 12 extend from a reference or middle plane in a first direction (in figure 1 upwardly) and in a second direction (in figure 1 downwardly), the second direction being opposite to the first direction. Both directions are orthogonal to the reference or middle plane.

[0024] By consequence, while the first material layer 12, taken as a whole, is generally flat with a thickness D which is low compared to its length (from left to right) and width (orthogonally to the drawing plane), the thickness D is distinct enough for providing the elasticity necessary for providing the required cushioning performance. The positions of the embossed protrusions 16 are arranged in an alternating order in the length direction as well as in the width direction. The first material layer 12 may further comprise a plurality of creases.

[0025] In the present exemplary embodiment the first material layer 12 is made from craft paper. It is particularly preferred that the first material layer 12 is made from recycled craft paper. The first material layer 12 is prefabricated which means that the protrusions 16 are embossed for example into a web type and flat starting material.

[0026] In the present exemplary embodiment a cross sectional shape, when viewed from the side, of the embossed protrusions 16 is approximately half-circular. Furthermore, in the present exemplary embodiment a cross sectional shape, when viewed from above, of the embossed protrusions 16 is approximately circular. The embossed protrusions may be formed as relatively small bulges similar to an egg carton.

[0027] As can be seen from figure 1, the second material layer 14 is arranged on top of the first material layer 12 and is essentially flat. Preferably, the second material layer 14 is made also from paper, for example a colored paper. By consequence, the second material layer 14 has properties (flat, color) which are different from the corresponding properties (protrusions, craft paper) of the first material layer 12. More specifically, while the first material layer 12 is primarily a functional layer providing the required cushioning properties, the second material layer 14 is primarily an optical layer providing a desired optical and haptic property.

[0028] Further, as can be seen from figure 1, the second material layer 14 is, taken as a whole, substantially parallel to the first material layer 12, and is regionally joined, namely at the tops of at least some of the upwardly extending protrusions 16, to the first material layer 12 at connection points 18. Furthermore, the second material layer 14 is regionally distant from the first material layer 12, namely in the regions of the downwardly extending

protrusions 16 of the first material layer 12.

[0029] The cushioning material 10 of figures 2 and 6 comprises a third material layer 20 which in the present exemplary embodiment is identical to the second material layer 14. This means that the third material layer 20 is, taken as a whole, substantially parallel to the first material layer 12 and regionally joined to at least some of the downwardly extending protrusions 16 of the first material layer 12 at connection points 18. By consequence, the first material layer 12 is sandwiched between the second material layer 14 and the third material layer 20.

[0030] As can be seen from figure 6, the cushioning material 10 may be formed as a sheet 22, in the present exemplary embodiment as a rectangular sheet 22. In an alternative non-shown embodiment, the sheet may be triangular, circular, oval, or the like. As can also be seen from figure 6, the sheet 22 of the embossed cushioning material 10 may comprise at least one line of weakened material strength, which in the present exemplary embodiment is a perforation line 24. This perforation line 24 allows a user to manually separate a portion 26 of the cushioning material from the remainder 28 along the perforation line 24 without the need of any additional specific tool.

[0031] As also can be seen from figure 6, the outer surface of the first material layer 12 may comprise in portion 26 and in the remainder 28 respective graphics 30, for example a logo of the company which has manufactured the object to be wrapped by the cushioning material 10, or the logo of the company which has manufactured the cushioning material 10, or use instructions of the cushioning material 10. The graphics 30 may of course also be purely ornamental.

[0032] According to the embodiment of figure 3 the second material layer 14 may be made from a rather thin and soft flexible material, for example silk paper. In this case, the second material layer 14 will not be entirely flat but rather present a certain degree of undulation, however will not tightly follow the shape of the first material layer 12 and therefore will still present a property which is different from the corresponding property of the first material layer 12.

[0033] According to the embodiment of figure 4, the second material layer 14 is made from a foam material 32 and therefore additionally provides a cushioning property. The foam material preferable is a starch foam or another foam material which is ecologically valuable.

[0034] According to the embodiment of figure 5, also the second material layer 14 comprises a plurality of embossed protrusions 34. However, the density of protrusions 34 per area of the second material layer 14 is different from the density of protrusions 16 per area of the first material layer 12. More specifically, the density of protrusions 34 of the second material layer 14 in the present exemplary embodiment is nearly five times higher than the density of protrusions 16 of the first material layer 12. Also, the height and the width of the protrusions 34 is considerably lower than the height and the width of

the protrusions 16.

[0035] It is to be understood that the different features of the different embodiments explained above may be combined in a nearly arbitrary manner.

List of reference signs

[0036]

10	cushioning material
12	first material layer
14	second material layer
16	protrusions (first material layer)
18	connection points
20	third material layer
22	sheet
24	perforation line
26	portion
28	remainder
30	graphics
32	foam material
34	protrusions (second material layer)

Claims

1. An embossed cushioning material (10) for wrapping an article, the cushioning material (10) comprising at least a first material layer (12) having a plurality of punctual embossed protrusions (16), **characterized in that** the cushioning material (10) comprises at least a second material layer (14), wherein at least one property of the second material layer (14) is different from the corresponding property of the first material layer (12).
2. The embossed cushioning material (10) of claim 1 wherein the second material layer (14) is, taken as a whole, substantially parallel to the first material layer (12), regionally joined to the first material layer (12), and regionally distant from the first material layer (12).
3. The embossed cushioning material (10) of claim 2 wherein the second material layer (14) is flat.
4. The embossed cushioning material (10) of at least one of the preceding claims wherein the first material layer (12) is a functional layer providing the required cushioning properties and the second material layer (14) is at least also an optical layer providing a desired optical property.
5. The embossed cushioning material (10) of claim 4 wherein the second material layer (14) additionally provides a cushioning property.
6. The embossed cushioning material (10) of claim 5

wherein the second material layer (14) comprises a plurality of embossed protrusions (34), the density of protrusions (34) per area of the second material layer (14) being different from the density of protrusions (16) per area of the first material layer (12). 5

7. The embossed cushioning material (10) of claim 6 wherein the density of protrusions (34) per area of the second material layer (14) is higher than the density of protrusions (16) per area of the first material layer (12) and wherein at least one dimension of the protrusions (34) of the second material layer (14) is lower than the corresponding dimension of the protrusions (16) of the first material layer (12). 10
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8. The embossed cushioning material (10) of claim 5 wherein the second material layer (14) comprises a foam material (32).
9. The embossed cushioning material (10) of at least one of the preceding claims wherein the first material layer (12) is made from paper, preferably from craft paper, more preferably from recycled kraft paper. 20
10. The embossed cushioning material (10) of at least one of the preceding claims wherein the second material layer (14) is made from paper, preferably from colored paper. 25
11. The embossed cushioning material (10) of at least one of the preceding claims wherein it is formed as a sheet (22), preferably a rectangular sheet (22). 30
12. The embossed cushioning material (10) of at least one of the preceding claims wherein it comprises at least one line of weakened material strength, preferably a perforation line (24), allowing to separate a portion (26) of the cushioning material (10) from the remainder (28) along the line (24). 35
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13. The embossed cushioning material (10) of at least one of the preceding claims wherein it comprises a third material layer (20) which is, taken as a whole, substantially parallel to the first material layer (12) and regionally joined to the first material layer (12), and wherein the first material layer (10) is sandwiched between the second material layer (14) and the third material layer (20). 45
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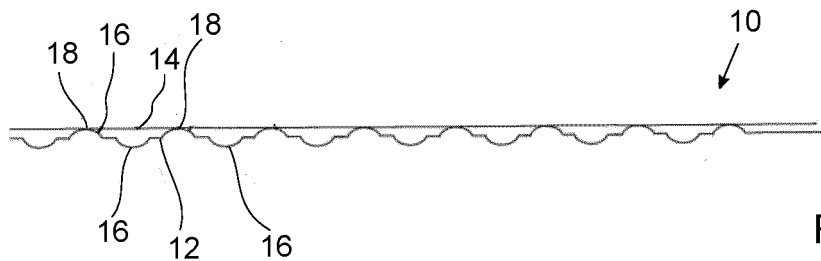


FIG.1

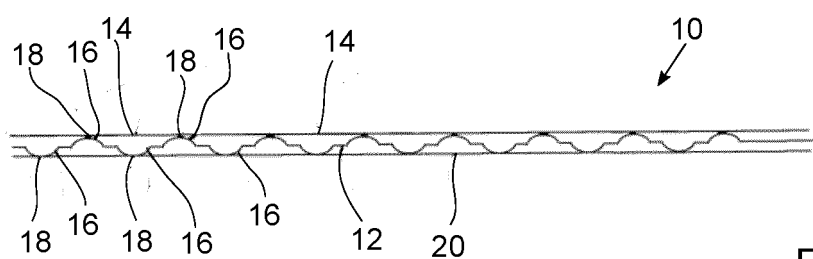


FIG.2

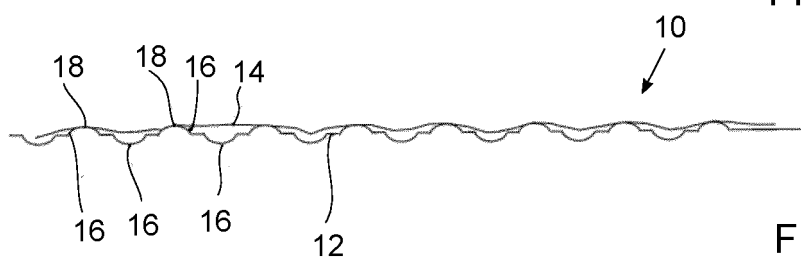


FIG.3

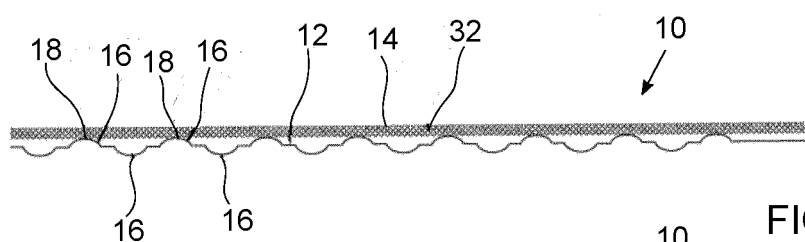


FIG.4

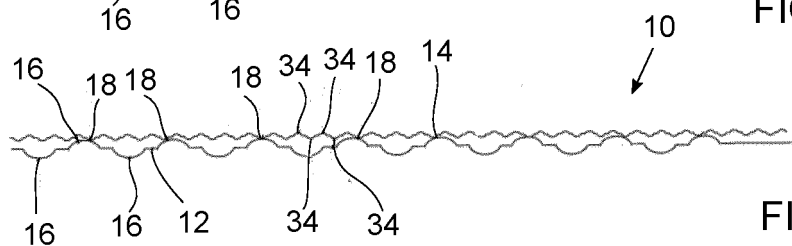


FIG.5

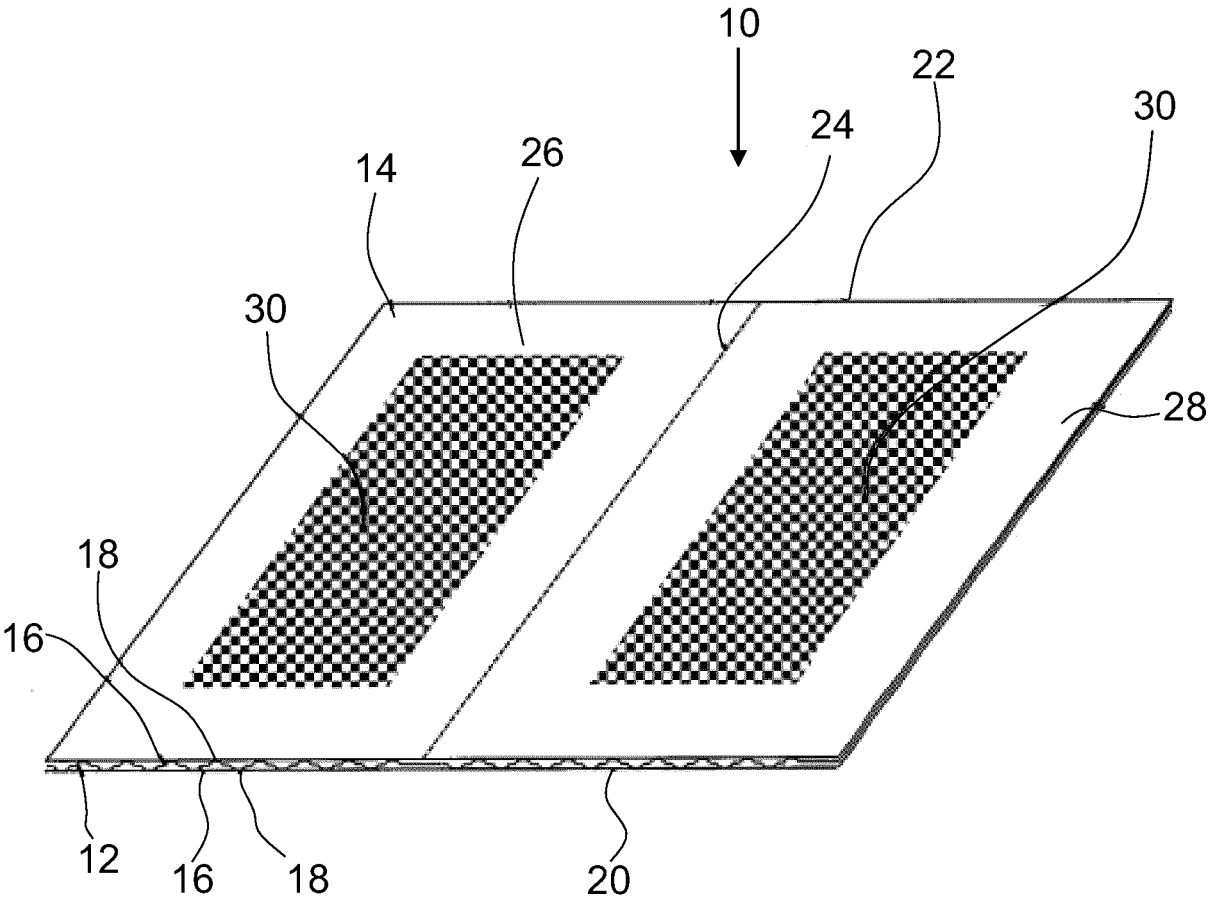


FIG.6



EUROPEAN SEARCH REPORT

Application Number
EP 20 18 6032

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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 Munich		Date of completion of the search 12 January 2021	Examiner Janosch, Joachim
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EPO FORM 1503 03.82 (P04C01)

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EP 20 18 6032

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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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