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(54) **Ship's hatch**

Schiffslukendeckel

Panneau d'écouille pour navires

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(73) Proprietor: **Baeck, Arthur Gerard**
B-2490 Balen (BE)

(72) Inventor: **Baeck, Arthur Gerard**
B-2490 Balen (BE)

(74) Representative: **Pieraerts, Jacques et al**
GEVERS Patents,
Brussels Airport Business Park,
Holidaystraat 5
B-1831 Diegem (BE)

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Description

This invention relates to a ship's hatch, more particularly of the "Frieze kap" type, made of non self-supporting thin metal sheet and having trapezoidal corrugations extending in the longitudinal direction, the height/depth of which, i.e. the distance between the upper surface of the ship's hatch and the bottom of the trapezoidal corrugations, determines the height/thickness of the ship's hatch.

A ship's hatch of said type is formed by folding metal sheet in such a manner that trapezoidal gutter-shaped corrugations are formed with constant dimensions, i.e. both the height/depth of the corrugations and the width of the corrugation bottom remain constant. The trapezoidal gutter-shaped corrugations permit the stacked hatches to be inserted into one another. The height or thickness of the hatch is further constant so that the height or thickness in the area of the coaming is the same as in the middle of the hatch.

A ship's hatch of the above intended type has in the area of the coaming on the underside between the negatively positioned corrugations a transverse reinforcement serving also as flap box. The coaming is provided with notches for placing the trapezoidal corrugations fittingly therein.

Another type of ship's hatch (see EP-A-0 153 770) is formed by folding metal sheet in such a manner that the trapezoidal gutter-shaped corrugations have gradually and continuously decreasing dimensions. At least one side of the corrugation decreases thereby gradually and continuously in height/depth, i.e. the intermediary corrugations and the overlapping outer corrugations, the latter in the use position, decrease gradually and continuously in height/depth. In some embodiments, the width of the bottom of the corrugations increases proportionally to said decrease of the height/depth.

The height/depth of the corrugations decreases, and this from the middle towards the coaming.

A ship's hatch of this latter type does not need notches in the coaming because the height/depth of the corrugations is, in the area of the coaming, equal to the thickness of the flap box.

A drawback of the here intended ship's hatch is the more complicated production method since, just because of the changing height/depth of the sides of the corrugations, the sheet material has to be outlined trapezoidally in view of the cutting, snipping and folding process. Hereby is meant that in this case the folding or cutting line has to be marked (traced) onto each panel from which a hatch is made.

In the first place the invention has as object to design a ship's hatch which rests fittingly on the coamings without having to cut notches therein.

Moreover, the ship's hatch according to the invention enables a markedly improved production method, allowing a semi-automated production process. A cutting, snipping and folding bench does not have to be used then for said time-consuming preparatory steps.

An unrolling/"slit" chaining and profiling machine can be used.

An additional object of the invention is to design a ship's hatch of the type intended in the preamble, which offers the following advantages compared to the presently existing ship's hatches :

- 1) Lower stack height for a same strength ;
- 2) Or vice versa, a higher strength for a same stack height ;
- 3) Resisting the large transverse forces present in the area of the coaming.

In order to enable this, the ship's hatch according to the invention consists of two parts, i.e. a part of which the constant height/depth of the corrugations (gutters) determines the height/thickness of the hatch and a part in the form of an extension with a smaller height/depth of the corrugations, which is situated, in the use position, in the area of the coaming, and further characterised in that said upper surface of the ship's hatch is connected to said extension by means of an inclined plate.

Still according to the invention, said inclined plate extends in such a manner between said upper surface of the ship's hatch and said extension, that the connection by means of said inclined plate between the upper surface and the extension ensures a good transfer of the strength of said trapezoidal corrugations onto the coamings of the ship.

A remarkable feature of the invention consists in that the height of the trapezoidal corrugations of said extension corresponds substantially to the height of a transverse reinforcement situated at the bottom of the extension and serving also as flap box.

According to the invention there is also provided a method for making a ship's hatch as defined in claim 5.

Other details and advantages of the invention will appear from the following description of a ship's hatch, more particularly of the "Frieze kap" type, according to the invention. This description is only given by way of example and does not limit the invention. The reference numerals relate to the figures annexed hereto.

Figure 1 is a perspective representation of the low-est extremity of a ship's hatch according to the invention.

Figure 2 is, on a larger scale, a front view of a ship's hatch according to the invention with a partial view of two ship's hatches co-operating therewith and with the coaming in front view.

Figure 3 is a longitudinal section across the extremity of a ship's hatch according to the invention showing however the coaming.

Figures 4 and 5 are side views of two possible embodiments of ship's hatches according to the invention.

The ship's hatch according to the invention and shown by these figures distinguishes itself thus clearly from the hitherto known ship's hatches mentioned in the

preamble by the combination of characteristics by which the production of these hatches can be simplified considerably and can be manufactured according to a semi-continuous process, while the so manufactured ship's hatches permit moreover a continuous connection with the upper edge of the coamings, so that no notches are to be cut into these coamings.

Ship's hatches according to the invention can have several trapezoidal corrugations extending in the longitudinal direction. In the figures, only two overlapping outer corrugations were depicted. These overlapping outer corrugations are clarified by reference 1. By reference 2 is indicated the bottom of the trapezoidal corrugations, while the sides 3 and 4 refer to an inner and outer side, respectively. The outer side 4 can have a continuous height (for example ± 3 cm) as clearly shown in Figure 1.

Essential for the invention is thus a constant height of the inner side 3 of the overlapping outer corrugations 1. Hereby is thus meant that the ship's hatches show a constant height/thickness over their entire length, except however for the part which is situated at the extremities and which consists of the extension 5, the upper surface 6 of which determines locally a height/thickness of the ship's hatch which is considerably smaller than the height/thickness of the ship's hatch measured over the remaining part of its length.

Between the upper surface 7 of the ship's hatch and the upper surface 6 of the extension, a considerable difference can be seen. Between both upper surfaces 6 and 7, a plate 8 is provided which is welded along the lateral sides 3 and which can also be welded along the lines a and b, unless one of these weld connections is replaced by folding the sheet material.

This structure of the ship's hatches offers several advantages, two of which will be very clearly underlined.

First of all, the structure of the extension 5 with "lowered" upper surface 6 allows to apply a transverse reinforcement (Figures 2 and 3), which serves as flap box 9. The height of such a flap box 9 is thus relatively small and allows in any case to provide a continuous surface between the underside of the gutters 2 and the underside of the actual flap box 9, so that it is possible to put the successive ship's hatches onto the coamings 10 without having to cut out notches in the upper edge of the coaming 10. Cutting out said notches is a time-consuming delicate operation which does not have to be performed here because the ship's hatches according to the invention provide a continuous surface between the underside of the different gutters and the transverse reinforcements which are fixed therebetween, and which serve as flap box 9.

A second very important advantage offered by the structure of the ship's hatches according to the invention is the possibility to manufacture the sheet material of the ship's hatches, the height/thickness of which is constant in both parts, according to a semicontinuous process by using a profiling-"Rollform" machine. The concept of the new ship's hatches allows thus to manu-

facture stackable and insertable ship's hatches, the above mentioned parts of which can be made from the coils by a profiling-"Rollform" machine, so that only at the lines a and b an additional welding operation is required to connect the actual ship's hatch to its lowered extension.

A further advantage is the lower stack height of the inserted ship's hatches in case of a larger span.

The angles formed by the sides of the different gutters with the bottom of the overlapping outer corrugations can have very diverse values. The different angles deducible from the figures are in no way binding for the invention.

Also the angle between the plate 8 and the upper surfaces 6 and 7 is not strictly determining, although this angle has yet to meet two criteria, namely :

- a) the ship's hatches have to be well insertable ;
- b) the connection between the upper surface and the extension by means of the inclined plate 8 has to ensure a good transfer of the strength of the trapezoidal corrugations of the hatch onto the coaming 10 of the ship.

It is clear that the invention is not limited to the embodiment described hereinabove and that important modifications could be applied thereto, provided they still fall within the scope of the claims annexed hereto.

Claims

1. A ship's hatch, more particularly of the "Frieze kap" type, made of non self-supporting thin metal sheet and having trapezoidal corrugations (1) extending in the longitudinal direction, the height/depth of which, i.e. the distance between the upper surface (7, 6) of the ship's hatch and the bottom (2) of the trapezoidal corrugations, determines the height/thickness of the ship's hatch, characterised in that it consists of two parts, i.e. a part of which the constant height/depth of the corrugations (gutters) determines the height/thickness of the hatch and a part in the form of an extension (6) with a smaller height/depth of the corrugations, which is situated, in the use position, in the area of the coaming (10), and further characterised in that said upper surface (7) of the ship's hatch is connected to said extension by means of an inclined plate (8).
2. A ship's hatch according to claim 1, characterised in that said inclined plate (8) extends in such a manner between said upper surface (7) of the ship's hatch and said extension (6), that the connection by means of the inclined plate between the upper surface and the extension ensures a good transfer of the strength of said trapezoidal corrugations (1) onto the coamings (10) of the ship.

3. A ship's hatch according to either one of the claims 1 and 2, characterised in that the height of the trapezoidal corrugations (1) of said extension (6) corresponds substantially to the height in cross section of a transverse reinforcement (9) situated underneath the extension and serving also as flap box.
4. A ship's hatch according to claim 3, characterised in that the height of said transverse reinforcement (9) has been chosen in such a manner that said trapezoidal corrugations (1) of the extension (6) and said transverse reinforcement are situated with their bottom side in a continuous plane and rest thus upon a continuously extending upper edge of a coaming (10).
5. A method for making a ship's hatch according to claim 1, characterised in that both said non self-supporting metal sheet with trapezoidal corrugations (1) forming said one part of the hatch and said extension (6) are folded in a profiling-"Rollform" machine and cut off to the length.

Patentansprüche

1. Ein Schiffslukendeckel, im besonderen vom "Friešekap"-Typ, der aus nicht-selbsttragendem dünnen Metallblech hergestellt ist und trapezoidale Rillen (1) aufweist, welche sich in die longitudinale Richtung erstrecken, wobei deren Höhe/Tiefe, d. h. der Abstand zwischen der Oberseite (7, 6) des Schiffslukendeckels und dem Boden (2) der trapezoidalen Rillen, die Höhe/Dicke des Schiffslukendeckels bestimmt, dadurch gekennzeichnet, daß er aus zwei Teilen besteht, d. h. aus einem Teil, von dem die konstante Höhe/Tiefe der Rillen (Kanäle) die Höhe/Dicke des Lukendeckels bestimmt, und aus einem Teil in der Gestalt einer Verlängerung (6) mit einer kleineren Höhe/Tiefe der Rillen, welche in der Anwendungsstellung im Bereich des Sülls (10) angeordnet ist, und ferner dadurch gekennzeichnet, daß die Oberseite (7) des Schiffslukendeckels mittels einer geneigten Platte (8) mit der Verlängerung verbunden ist.
2. Ein Schiffslukendeckel nach Anspruch 1, dadurch gekennzeichnet, daß die geneigte Platte (8) sich in einer Weise zwischen der Oberseite (7) des Schiffslukendeckels und der Verlängerung (6) erstreckt, daß die Verbindung mittels der geneigten Platte zwischen der Oberseite und der Verlängerung eine gute Übertragung der Festigkeit der trapezoidalen Rillen (1) auf die Sülle (10) des Schiffes sicherstellt.
3. Ein Schiffslukendeckel nach einem der Ansprüche 1 und 2, dadurch gekennzeichnet, daß die Höhe der trapezoidalen Rillen (1) der Verlängerung (6) im wesentlichen der Höhe im Querschnitt einer trans-

versalen Aussteifung (9) entspricht, die sich unterhalb der Verlängerung befindet und auch als Klapp-Box ("flap box") dient.

4. Ein Schiffslukendeckel nach Anspruch 3, dadurch gekennzeichnet, daß die Höhe der transversalen Aussteifung (9) derartig gewählt wurde, daß die trapezoidalen Rillen (1) der Verlängerung (6) und die transversale Aussteifung sich mit ihrer Bodenseite in einer fortlaufenden Ebene befinden und so auf einer sich fortlaufend erstreckenden oberen Kante eines Sülls (10) aufsitzen.
5. Ein Verfahren zur Herstellung eines Schiffslukendeckels nach Anspruch 1, dadurch gekennzeichnet, daß sowohl das nicht-selbsttragende Metallblech mit trapezoidalen Rillen (1), welches den einen Teil des Lukendeckels bildet, als auch die Verlängerung (6) in einer Profiler-"Rollform"-Maschine abgekantet und auf die Länge zugeschnitten werden.

Revendications

1. Panneau d'écoutille pour navire, plus particulièrement du type "Friešekap", fait d'une mince feuille métallique non autoportante et comportant des cannelures trapézoïdales (1) s'étendant dans la direction longitudinale, dont la hauteur/profondeur, c'est-à-dire la distance entre la surface supérieure (7, 6) du panneau d'écoutille pour navire et le fond (2) des cannelures trapézoïdales, détermine la hauteur/épaisseur du panneau d'écoutille pour navire, caractérisé en ce qu'il se compose de deux parties, c'est-à-dire une partie dont la hauteur/profondeur constante des cannelures (gouttières) détermine la hauteur/épaisseur du panneau d'écoutille et une partie sous la forme d'un prolongement (5) avec une plus petite hauteur/profondeur des cannelures, qui est située, dans la position d'utilisation, dans l'aire de l'hiloire (10), et de plus caractérisé en ce que la surface supérieure (7) du panneau d'écoutille pour navire est reliée audit prolongement au moyen d'une plaque inclinée (8).
2. Panneau d'écoutille pour navire suivant la revendication 1, caractérisé en ce que la plaque inclinée (8) s'étend d'une manière telle entre la surface supérieure (7) du panneau d'écoutille pour navire et le prolongement (5), que la liaison au moyen de la plaque inclinée entre la surface supérieure et le prolongement assure un bon transfert de la résistance des cannelures trapézoïdales (1) sur les hiloires (10) du navire.
3. Panneau d'écoutille pour navire suivant l'une ou l'autre des revendications 1 et 2, caractérisé en ce que la hauteur des cannelures trapézoïdales (1) du prolongement (5) correspond sensiblement à la

hauteur en coupe transversale d'un renforcement transversal (9) situé en dessous du prolongement et servant également de bac à clapet.

4. Panneau d'écouille pour navire suivant la revendication 3, caractérisé en ce que la hauteur du renforcement transversal (9) a été choisie de telle manière que les cannelures trapézoïdales (1) du prolongement (5) du renforcement transversal soient situés avec leur face inférieure dans un plan continu et s'appuient ainsi sur un bord supérieur s'étendant de façon continue d'une hiloire (10). 5 10
5. Procédé de fabrication d'un panneau d'écouille pour navire suivant la revendication 1, caractérisé en ce que la feuille métallique non autoportante avec les cannelures trapézoïdales (1) formant la première partie du panneau d'écouille et le prolongement (5) précité sont tout deux pliés dans une machine de profilage "Rollform" et découpés à la longueur. 15 20

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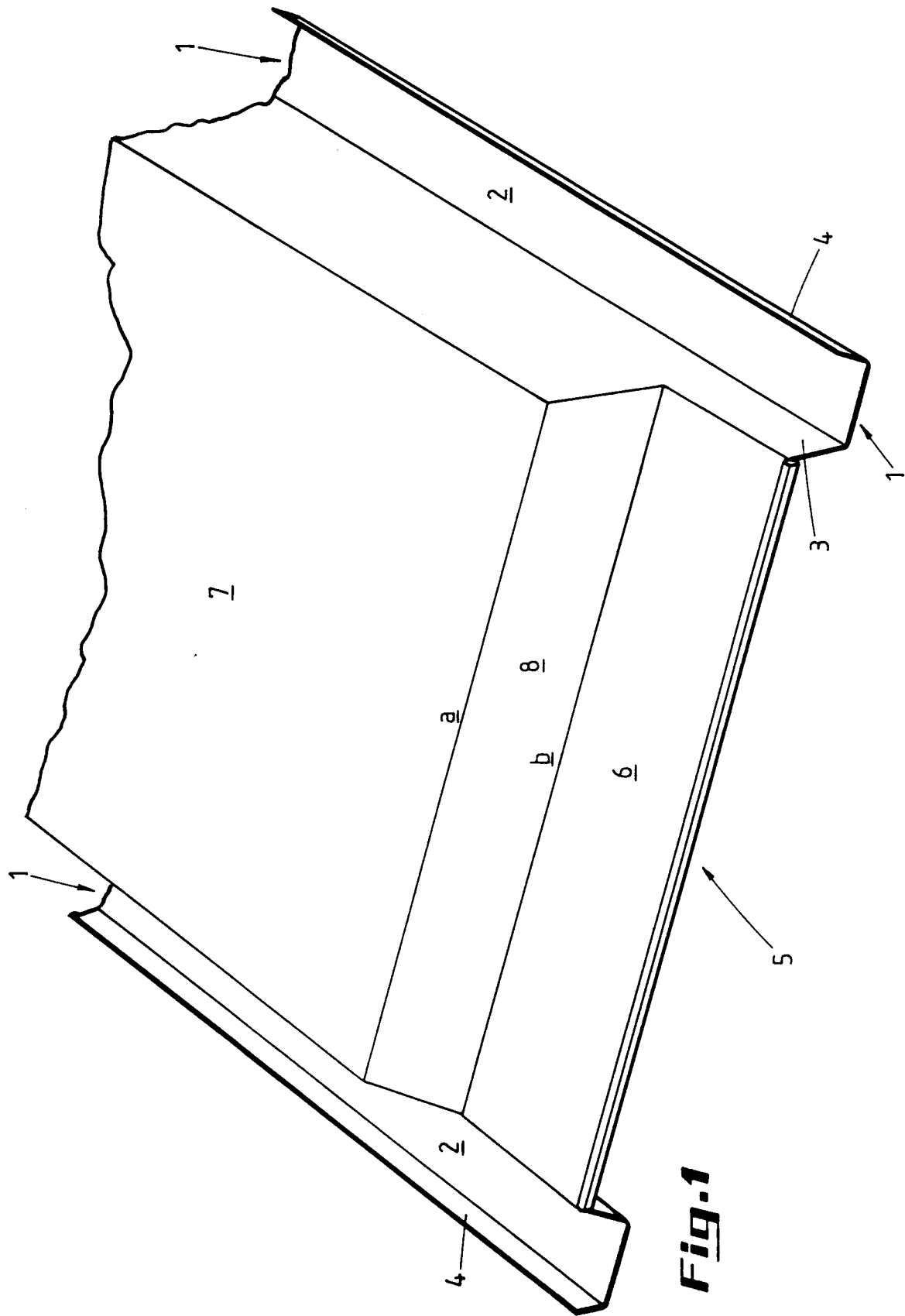


Fig. 1

