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(54) Screen for machines

(57) A method for producing panels for a screen for machines that is suitable for placing in front of or around the machine, in which the starting material is steel plate, and in which use is made of an angle bending device. The screen for machines is assembled from uprights and from panels fitted between said uprights. In the method a first type of panel is produced in one piece from a steel plate that is bent in edge areas by means of the angle bending device. Holes for fixing to the uprights are made in the bent edge areas. In the method a second type of panel is produced by forming strips of steel plate by means of the angle bending device to a bent, angled section which has legs. Furthermore, in the method holes for fixing to the uprights are provided in one leg of the angled section. A framework is constructed from the bent, angled sections, in which in each case the leg of each angled section that has been provided with holes lies on the periphery of the framework and another leg lies on the front side of the framework. A piece of mesh, a sheet or something of that type is fitted in the framework.

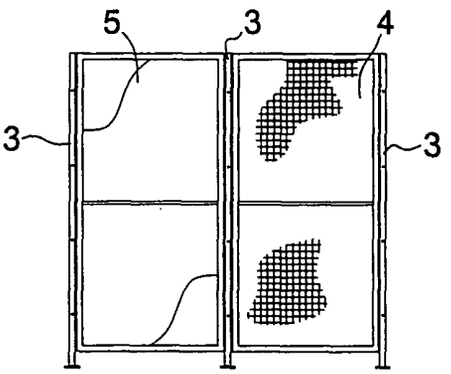

Fig. 1e

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Description

[0001] The invention relates to a method for producing panels for a screen for machines that is suitable for placing in front of or around the machine, which screen for machines is assembled from uprights and from panels fitted between said uprights.

[0002] It is known to produce such panels by constructing a rectangular framework from tubular sections. In the case of one type of panel a rectangular sheet, for example of steel, is subsequently fixed to the framework on one side of the framework, so that the surface inside the framework is covered. In the case of another type of panel a rectangular piece of mesh is fitted on the framework, so that a see-through panel is obtained. The tubular sections used usually have a square or a rectangular cross section. The tubular sections are fixed to each other by means of welding. The sheet or the mesh is fixed on one of the sides of the tubular sections, and in such a way the framework is fixed by welding.

[0003] A panel produced by the known method does not have an attractive finish. Furthermore, a screen for machines constructed of panels of different types, i.e. from panels with mesh and panels with a sheet, does not look uniform.

[0004] The object of the invention is to provide an alternative method for producing panels for a screen for machines, by means of which panels of different types can be produced with a uniform appearance.

[0005] This object is achieved by a method according to the preamble of claim 1, in which the starting material is steel plate, in which use is made of an angle bending device, and in which

(a) a first type of panel is produced in one piece from a steel plate that is bent in edge areas by means of the angle bending device, holes for fixing to the uprights being made in the bent edge areas,
(b) a second type of panel is produced by

- forming strips of steel plate by means of the angle bending device to a bent, angled section which has legs,
- making holes for the fixing to the uprights in one leg of the angled section,
- constructing a framework from the bent, angled sections, in which in each case the leg of each angled section that has been provided with holes lies on the periphery of the framework and another leg lies on the front side of the framework,
- fitting a piece of mesh, a sheet or something of that type in or on the framework.

[0006] Owing to the fact that the panels of the first type and the sections for the panels of the second type are made of steel plate by means of an angle bending device, these different panels can be made in the same way and made to measure. Different types of panel having the same external appearance at the edges can therefore be made. By this production method a screen for machines constructed from different types of panel and having a uniform external appearance is obtained.

[0007] Moreover, production of the panels according to the invention is cheaper than production of comparable panels according to the known method, because the panels of the first type can be made easily and quickly by bending and making holes, while the production of a comparable panel according to the prior art is laborious, because tubular sections first have to be shortened and a framework has to be welded, and then a sheet still has to be fitted on the framework, for example by welding.

[0008] Preferred embodiments of the invention are described in subclaims 2 - 11.

[0009] The invention further relates to a modular system for assembling a screen for machines according to claim 12, to panels for a screen for machines according to claim 13, and to a screen for machines according to claim 14.

[0010] The invention will be explained in greater detail below with reference to the drawing, in which:

Fig. 1a shows a top view of a screen for machines according to the invention;
Fig. 1b shows a view according to the arrow B in Fig. 1a of the screen for machines;
Fig. 1c shows a view according to the arrow C in Fig. 1a of the screen for machines;
Fig. 1d shows a view according to the arrow D in Fig. 1a of the screen for machines;
Fig. 1e shows a view according to the arrow E in Fig. 1a of the screen for machines;
Fig. 2 shows a view in perspective of a corner part of a panel of the screen for machines of Figs. 1a to 1e;
Fig. 3 shows a view in perspective of a corner part of another panel of the screen for machines of Figs. 1a to 1e;
Fig. 4 shows a view in perspective of a corner part of yet another panel of the screen for machines of Figs. 1a to 1e;
Fig. 5 shows a cross section of an angled section for the production of the panels of Figs. 3 and 4;
Fig. 6 shows the fixing of a sheet in a framework of the panel of Fig. 4; and
Fig. 7 shows the fixing of a piece of mesh in a framework of the panel of Fig. 3.

[0011] Figs. 1a to 1e show a screen 1 for machines according to the invention, which screen for machines is placed around a machine 2, as becomes clear from the top view of Fig. 1a. The screen 1 for machines in the example shown is constructed of uprights 3 and of panels 4 to 9 fitted between said uprights.

[0012] Fig. 1b shows a view according to the arrow B in Fig. 1a. This view shows the panel 8 in the form of a

frame with a transparent plastic sheet in said frame. The production of the panels will be reverted to later. A panel 7 that can be slid to and fro according to the double arrow 7a in Fig. 1a, can also be seen. In order to gain access to the machine 2, the panel 7 can be slid with the aid of a guide construction (not shown) in front of the panel 8, so that an access aperture is obtained in the screen 1. The panel 7 is formed in one piece from steel plate.

[0013] Fig. 1c shows a view according to the arrow C in Fig. 1a. This view shows the panel 6 in the form of a frame with a mesh provided in said frame. The production of such a panel will be reverted to later. The panel is hinged to one of the uprights 3, so that an access door to the machine 2 is obtained. The panel 6 can be opened according to the double arrow 6a.

[0014] Fig. 1d shows a view according to the arrow D in Fig. 1a. This view shows the panel 9, which is formed from a piece of steel plate. The production of the panel will be reverted to later.

[0015] Fig. 1e shows a view according to the arrow E in Fig. 1a. This view shows the panel 5 in the form of a frame with a transparent plastic sheet in said frame. A panel 4 can also be seen, which panel is in the form of a frame with a mesh in said frame.

[0016] A particular configuration of the screen for machines is shown in the example, but it is possible to construct a screen for machines in a totally different configuration from uprights 3 and panels 4 to 9. The invention therefore provides a modular system for the assembly of a screen 1 for machines, comprising uprights 3 for placing on end on a floor and various panels 4 to 9, which are made for placing between the uprights 3.

[0017] Steel plate is the starting material used for the production of the various panels 4 to 9.

[0018] A part of a first type of panel is shown in Fig. 2. The panels 7 and 9 from Figs. 1a to 1e are of this type. This type of panel is made in one piece from a steel plate. Use is made here of an angle bending device, by means of which the steel plate is bent in edge areas. It can be seen in Fig. 2 that the plate 19 on the side edge in the edge area 20 has been bent along a bending line 21 and on the underside has been bent along a bending line 22. Holes 23 are preferably made in the edge areas 20, before the latter are bent, which holes are used during the fixing of the panel to the uprights 3.

[0019] Fig. 3 shows another panel, which corresponds to the panels 4 and 6 from Figs. 1a to 1e and is made by constructing a framework 30 from bent, angled sections 31, 32, one leg 31a, 32a from each angled section lying on the periphery of the framework 30. Another leg 31b, 32b lies on the front side of the framework 30. A piece of mesh 34 is then placed in the framework 30, the edges of the piece of mesh 34 being fixed on the inside of the angled sections 31, 32, for example by welding. Fixing holes 33 are provided in the leg 31, which fixing holes are used during the fixing of the panel to the uprights 3.

[0020] Fig. 4 shows yet another panel, which corresponds to the panels 5 and 8 from Figs. 1a to 1e and is made by constructing a framework 40 from bent, angled sections 41, 42, one leg 41a, 42a of each angled section lying on the periphery of the framework 40. Another leg 41b, 42b lies on the front side of the framework 40. A transparent plastic sheet 44, preferably of Lexane or Perspex, is then placed in the framework 40, the edges of the sheet 44 being fixed on the front side of the angled sections 41, 42, on the legs 41b, 42b. A section 60 is used for fixing the sheet 44 to the framework 40, which section will be explained in greater detail further on in the description. Fixing holes 43 are provided in the leg 41, which fixing holes are used during the fixing of the panel to the uprights 3.

[0021] The angled sections 31, 32, 41, 42 are formed from strips of steel plate by means of the angle bending device to produce a bent, angled section which has legs. Fig. 5 shows a cross section of such a section 50. The section shown in Fig. 5 is in the form of a U-section with three legs 51, 52 and 53. The longest leg 51 with a free end is preferably four times the length of the shortest leg with a free end.

[0022] When the framework 30 or 40 has been constructed, the longest leg 51 lies on the periphery of the framework 30 or 40, the middle leg 52 lies on the front side of the framework 30, 40, and the shortest leg 53 projects inwards in the direction of the mesh 34 or the sheet 44. Owing to the fact that the leg 53 extends inwards, a nicely finished appearance is obtained.

[0023] The legs 31a, 41a of the section for the panels of Figs. 3 and 4 lying on the periphery of the framework 30, 40 are preferably made the same length as the bent edge areas 20 of the panel shown in Fig. 2. In this way a system with various types of panels is obtained, but a uniform external appearance is still provided.

[0024] Fig. 6 shows how clamping means in the form of a Z-shaped section 60 are provided on the front side of the angled section 50, by means of which clamping means the plastic sheet 44 is clamped down on the framework 40. The Z-shaped section 60 can be fixed on the framework 40 by means of screws 80 (see Fig. 4) or in another way. Holes are provided in the legs 41b, 42b (see Fig. 4) for mounting of the screws 80.

[0025] The piece of mesh 34 in the framework 30 shown in Fig. 3 is preferably made of steel and is preferably welded to the inside of the U-sections 50 to the short legs 53, as indicated in Fig. 7, in which a weld 70 is visible.

Claims

1. Method for producing panels for a screen for machines that is suitable for placing in front of or around the machine, which screen for machines is assembled from uprights and from panels fitted between said uprights, **characterized in that** the

starting material is steel plate, **in that** use is made of an angle bending device, and **in that**

(a) a first type of panel is produced in one piece from a steel plate that is bent in edge areas by means of the angle bending device, holes for fixing to the uprights being made in the bent edge areas,
(b) a second type of panel is produced by

- forming strips of steel plate by means of the angle bending device to a bent, angled section which has legs,
- making holes for the fixing to the uprights in one leg of the angled section,
- constructing a framework from the bent, angled sections, in which in each case the leg of each angled section that has been provided with holes lies on the periphery of the framework and another leg lies on the front side of the framework,
- fitting a piece of mesh, a sheet or something of that type in or on the framework.

2. Method according to claim 1, in which the angled section is in the form of a U-section with three legs.

3. Method according to claim 2, in which a U-section with unequal legs is formed.

4. Method according to claim 3, in which the strips of steel plate for the second type of panel are bent in such a way that the long legs of the U-sections are at least four times the length of the short legs.

5. Method according to one of claims 3 - 4, in which the framework is constructed in such a way that the middle leg of each U-section lies on the front side of the framework and the longest leg lies with a free end of each U-section on the periphery of the framework.

6. Method according to one of claims 1 - 5, in which the legs of the section for the second type of panel which lie on the periphery of the framework are made the same length as the bent edge areas of the first type of panel.

7. Method according to one of claims 1 - 5, in which clamping means are provided on the front side of the angled section, by means of which clamping means the sheet is clamped down on the front side of the framework.

8. Method according to one of claims 1 - 7, in which the sheet used is a plastic sheet.

9. Method according to claim 8, in which a transparent sheet is used.

10. Method according to claim 3, in which the edges of the piece of mesh are welded to the inside of the U-sections.

11. Method according to claim 10, in which the edges of the piece of mesh are welded on the inside of the U-sections to the short legs.

12. Modular system for assembling a screen for machines, comprising uprights for placing on end on a floor and panels produced by a method according to one of claims 1 - 11, for placing between the uprights.

13. Panels for a screen for machines produced by a method according to one of claims 1 - 11.

14. Screen for machines, comprising uprights that can be placed on end on a floor and panels produced by a method according to one of claims 1 - 11, in which the panels can be mounted on the uprights.

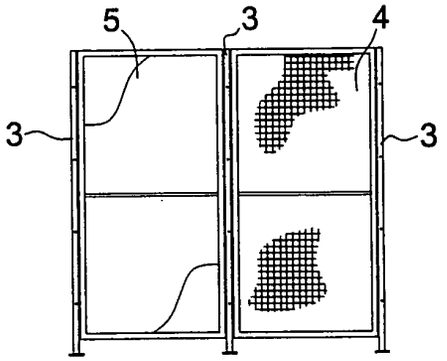

Fig. 1e

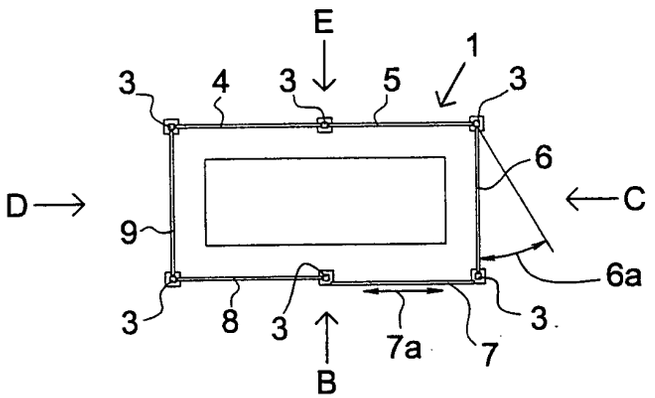

Fig. 1a

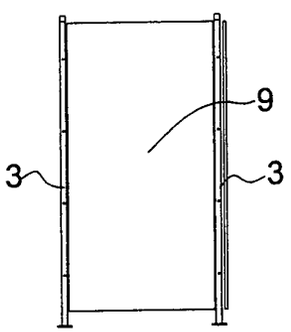

Fig. 1d

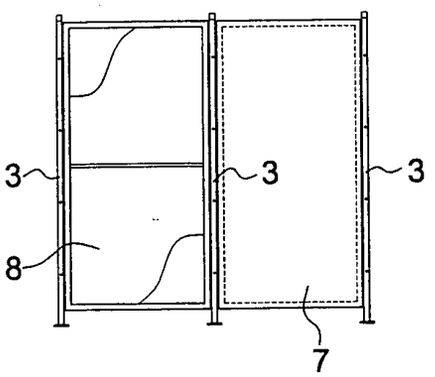

Fig. 1b

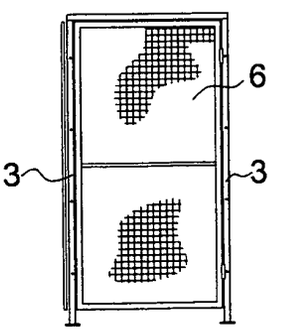

Fig. 1c

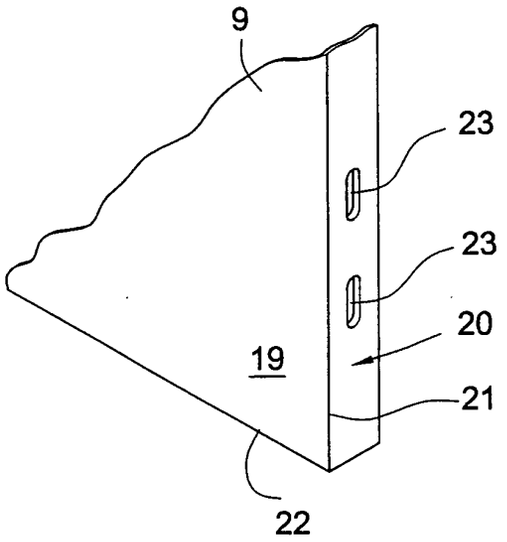

Fig. 2

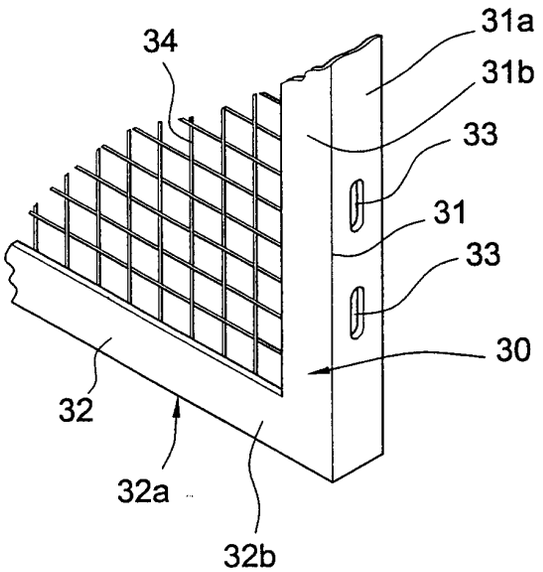

Fig. 3

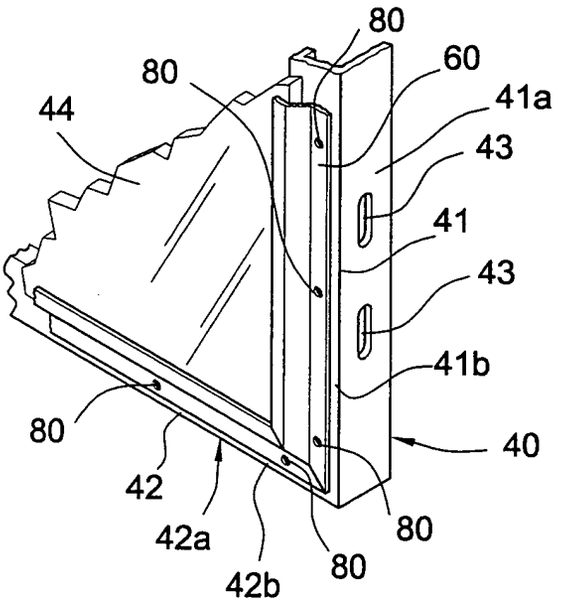

Fig. 4

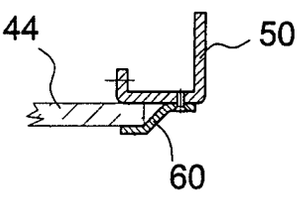

Fig. 6

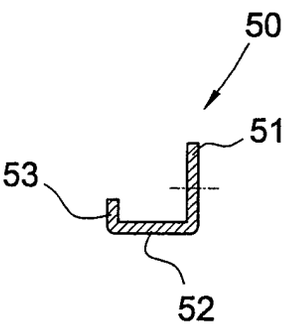

Fig. 5

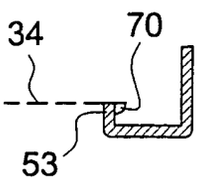

Fig. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 04 07 5040

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

E04H
E04B
E04C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	14 April 2004	Porwoll, H

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