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(54) **FIRE DOORS WITH IMPROVED ACOUSTIC ISOLATION - TECHNOLOGY OF PRODUCTION**

FEUERSCHUTZTÜR MIT VERBESSERTER SCHALLISOLIERUNG - TECHNOLOGIE ZUR
HERSTELLUNG

PORTES COUPE-FEU PRÉSENTANT UNE MEILLEURE ISOLATION ACOUSTIQUE -
TECHNOLOGIE DE PRODUCTION

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Description

[0001] The present invention is the manufacturing process of the fire door with increased sound insulation.

[0002] From the Chinese patent application no. CN202810575U is well-known the construction of a new door with increased sound insulation where in the sandwich structure between two layers of mineral wool, an insulation layer in the form of felt is arranged.

[0003] From the British patent application no. GB382325 is well-known the soundproof window for a cinematograph projection-room or other use comprises two separate glazed frames which are placed one on each side of the wall opening and are interconnected by bolts, bars, or distance-pieces.

[0004] From the French patent application no. FR2699207 is well-known the process for manufacturing a sandwich type sound insulation panel which consists of arranging adhesive pads of the same thickness as the infilling and pressing a minimum of two sheets on the outside faces.

[0005] The above mentioned Chinese and British solutions concern solely the construction itself and a completely different material is used as a sandwich insert in relation to present invention.

[0006] The French application reveals the way of implementation sound insulation panel using adhesive pads.

[0007] All mentioned above inventions do not provide satisfactory results in terms of improving acoustics.

[0008] The invention allows to develop a new manufacturing process of the fire door with increased insulation by an appropriate choice of materials, the order of connecting the particular layers primarily the connecting technology.

[0009] The increased sound insulation of mineral wool is well-known. However, it is unexpectedly claimed the use of a spacer in the form of corrugated cardboard between the two layers of mineral wool provides excellent results even to $R_w (C; C_{tr}) = 47 (-1; -4)$ dB, provided that the precisely defined manufacturing process is conducted. Failure to conducting the manufacturing process causes the sandwich has the same acoustic transmittivity factor as mineral wool i.e. $R_w = 32$ to $33 (-2; -5)$.

[0010] The manufacturing process of the invention characterized in that on a corrugated cardboard a glue, preferably polyurethane glue, in a regularly spaced pattern is applied, not linearly and not evenly, preferably from 8 to 18 points on the surface of the corrugated cardboard. Then the corrugated cardboard is connected with the layer of mineral wool, and the fabricated element is rotated and on the other side of the corrugated cardboard, a polyurethane glue in a regularly spaced pattern is applied, not linearly and not evenly, preferably from 8 to 18 points on the surface of the corrugated cardboard. Then the corrugated cardboard is engageably connected with the layer of mineral wool and the fabricated composite sandwich board is used as the inner panel of the door

leaf in a standard production process, so that on the fabricated steel profile of sash cover the glue is applied and the woodframe of laminated wood is inserted. Then the composite sandwich board is inserted, and on the upper surface of the composite sandwich board and the woodframe the glue is applied. Then the steel profile of sash cover is slid over, closing the construction of the door leaf. In the next step the fabricated door panel is placed in a heat press at least for 7 minutes.

[0011] Points which are similar to ellipse, or short stripes are used in place of the glue pattern.

[0012] The fig.1 shows the invention- the door which are fabricated on the basis of the manufacturing process. The fig.2 shows the view of the glue pattern of the door.

[0013] The manufacturing process of the invention characterized in that on a corrugated cardboard (3) a glue, preferably polyurethane glue, in a regularly spaced pattern (P) is applied, not linearly and not evenly, preferably from 8 to 18 points on the surface of the corrugated cardboard (3). Then the corrugated cardboard (3) is connected with the layer of mineral wool (2), and the fabricated element is rotated and on the other side of the corrugated cardboard (3), a polyurethane glue in a regularly spaced pattern (P) is applied, not linearly and not evenly, preferably from 8 to 18 points on the surface of the corrugated cardboard (3). Then the corrugated cardboard (3) is engageably connected with the layer of mineral wool (4) and the fabricated composite sandwich board (K) is used as the inner panel of the door leaf in a standard production process, so that on the fabricated steel profile of sash cover (1) the glue is applied and the woodframe of laminated wood is inserted. Then the composite sandwich board is inserted, and on the upper surface of the composite sandwich board (K) and the woodframe the glue is applied. Then the steel profile of sash cover (5) is slid over, closing the construction of the door leaf. In the next step the fabricated door panel is placed in a heat press at least for 7 minutes.

[0014] On a corrugated cardboard (3) a glue pattern (P) (a polyurethane glue) is applied regularly spaced, not linearly and not evenly, from 8 to 18 points on the surface of corrugated cardboard (3), then the corrugated cardboard (3) is engageably connected with the layer of mineral wool (2), and then the fabricated element is rotated and on the corrugated cardboard (3) the glue pattern (P) (the polyurethane glue) is applied regularly spaced, not linearly and not evenly, from 8 to 18 points on the surface of corrugated cardboard (3), then the corrugated cardboard (3) is engageably connected with the layer of mineral wool (4), the fabricated composite sandwich board (K) is used as the inner panel of the door leaf in a standard production process so that on the fabricated steel profile of sash cover (1) the glue is applied and then the woodframe of laminated wood is inserted, then the composite sandwich board (K) is inserted, and then on the upper surface of the composite sandwich board (K) and the woodframe the glue is applied, and then the steel profile of sash cover (5) is slid over closing the construction

of the door leaf, in the next step the fabricated door panel is placed in a heat press at least for 7 minutes.

Optionally

[0015] In place of the glue pattern (P) points which are similar to ellipse, or short stripes are used.

List of elements:

[0016]

1. Steel profile of sash cover
2. Mineral wool
3. Corrugated cardboard
4. Mineral wool
5. Steel profile of sash cover
- P. Glue pattern
- K. Composite sandwich board

Claims

1. The manufacturing process of a fire door with increased sound insulation comprising the following steps:

on a corrugated cardboard (3) a glue, preferably polyurethane glue, in a regularly spaced pattern (P) is applied, not linearly and not evenly, preferably from 8 to 18 points on the surface of the corrugated cardboard (3), the corrugated cardboard (3) is connected with the layer of mineral wool (2), then the fabricated element is rotated and on the other side of the corrugated cardboard (3) a glue, preferably polyurethane glue, in a regularly spaced pattern (P) is applied, not linearly and not evenly, preferably from 8 to 18 points, then the corrugated cardboard (3) is engageably connected with the layer of mineral wool (4), the fabricated composite sandwich board (K) is used as the inner panel of the door leaf in a standard production process, on the fabricated steel profile of sash cover (1) the glue is applied, the woodframe of laminated wood is inserted, the composite sandwich board (K) is inserted, on the upper surface of the composite sandwich board (K) and the woodframe the glue is applied, the steel profile of sash cover (5) is slid over, closing the construction of the door leaf, in the next step the fabricated door panel is placed in a heat press at least for 7 minutes.

2. The manufacturing process according to claim 1, characteristic in that points which are similar to ellipse, or short stripes are used in place of spaced

pattern (P).

Patentansprüche

1. Herstellungsverfahren einer Brandschutztür mit verstärkter Schalldämmung, umfassend folgende Verfahrensschritte:

Aufbringen eines Klebers, vorzugsweise Polyurethanklebers auf eine Wellpappe (3), in regelmäßig beanstandeten Mustern (P), nicht linear und nicht glatt, vorzugsweise in 8 bis 18 Punkten auf der Oberfläche der Wellpappe (3), Verbinden der Wellpappe (3) mit einer Schicht Mineralwolle (2), anschließendes Wenden des hergestellten Elements und danach Aufbringen eines Klebers, vorzugsweise Polyurethanklebers auf die andere Seite der Wellpappe (3), in regelmäßig beanstandeten Mustern (P), nicht linear und nicht glatt, vorzugsweise in 8 bis 18 Punkten, anschließendes Verbinden der Wellpappe (3) mit einer Schicht Mineralwolle (4), Einsetzen des hergestellten Sandwich-Verbundstoffbretts (K) als Innenpaneel des Türflügels in einem standardmäßigen Herstellungsprozess, Auftragen eines Klebstoffs auf das hergestellte Stahlprofil eines Fensterblendrahmens (1), Einlegen eines Holzrahmens aus Verbundholz, Einlegen des Sandwich-Verbundstoffbretts (K), Auftragen eines Klebers auf die Oberseite der Oberfläche des Sandwich-Verbundstoffbretts (K) und des Holzrahmens, Aufschieben des Stahlprofils des Fensterblendrahmens (5), Verschießen der Türblattkonstruktion, im nächsten Schritt wird das hergestellte Türpaneel in einer Heizpresse für mindestens 7 Minuten platziert.

2. Herstellungsprozess nach Anspruch 1, **gekennzeichnet dadurch, dass** anstatt des beanstandeten Musters elliptische oder kurze streifenförmige Punkte eingesetzt werden.

Revendications

1. Un procédé de fabrication d'une porte coupe-feu avec isolation acoustique accrue comprenant les étapes suivantes :

sur un carton ondulé (3) une colle, de préférence une colle de polyuréthane, est appliqué dans un motif régulièrement espacé (P), pas linéairement et pas uniformément, de préférence de 8

à 18 points sur la surface du carton ondulé (3),
le carton ondulé (3) est relié à la couche de laine
minérale (2).

puis l'élément fabriqué est inversé et de l'autre
côté du carton ondulé (3) une colle, de préfé- 5
rence une colle de polyuréthane, est appliqué
dans un motif régulièrement espacé (P),
pas linéairement et pas uniformément, de pré-
férence de 8 à 18 points,
puis le carton ondulé (3) est relié par engage- 10
ment à la couche de laine minérale (4),
le panneau sandwich composite fabriqué (K) est
utilisé comme panneau intérieur de la feuille de
porte dans un processus de fabrication stan-
dard, 15
la colle est appliquée sur le profilé en acier fa-
briqué de la couverture de châssis (1),
le cadre en bois de bois lamellé est inséré,
le panneau sandwich composite (K) est inséré, 20
la colle est appliquée sur la surface supérieure
du panneau sandwich composite (K) et du cadre
en bois,
le profil en acier de la couverture de châssis (5)
est glissé, fermant la construction de la feuille
de porte, 25
dans l'étape suivante, le panneau de porte fa-
briqué est placé dans une presse à chaud pen-
dant au moins 7 minutes.

2. Le procédé de fabrication selon la revendication 1, 30
caractérisé en ce que des points qui sont similaires
à une ellipse, ou bandes courtes sont utilisés à la
place du motif espacé.

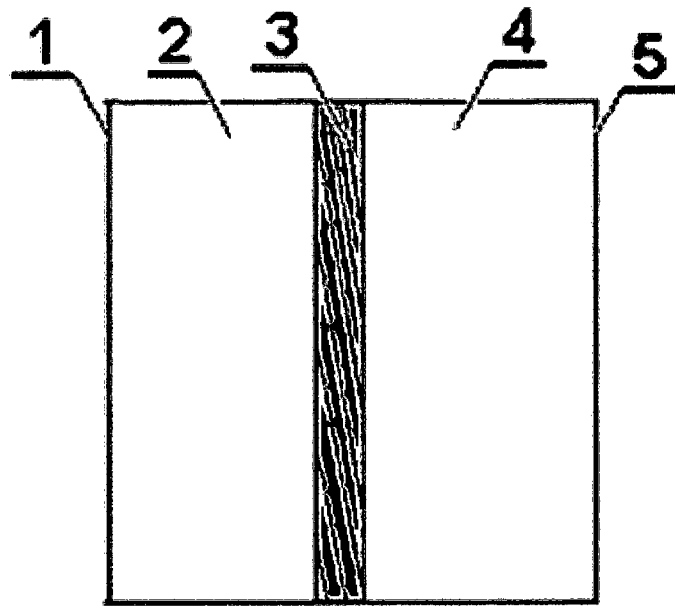
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K = 2, 3, 4

Fig.1

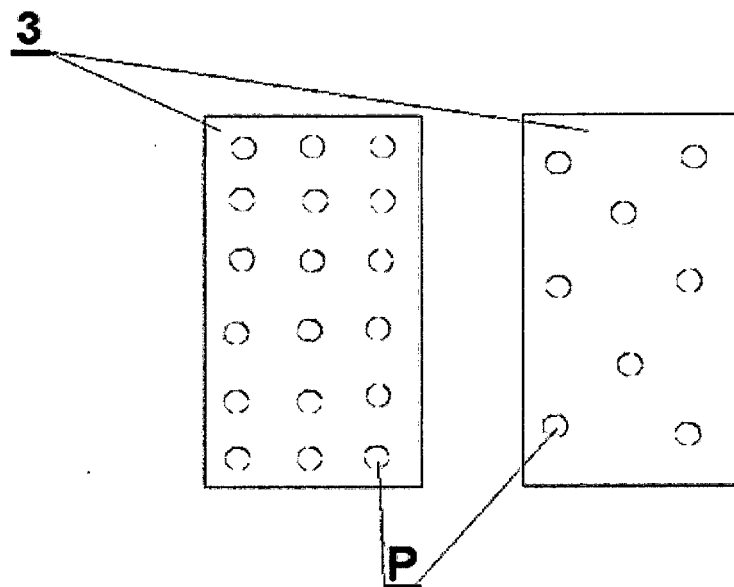


Fig.2

REFERENCES CITED IN THE DESCRIPTION

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