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(54) **A DOOR AND A METHOD FOR ITS MANUFACTURE.**

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Description

The present invention relates to a door of the kind which comprises a door frame having frame members which extend along the side surfaces and top and bottom edges of the door, and also of the kind which is clad with an outer panel on at least one flat side thereof, said panel being nailed to the frame members and also to at least one nailing batten, and in which door the cavities defined between the door-frame members and the at least one nailing batten are filled with insulating material in sheet form. The invention also relates to a preferred method for manufacturing the inventive door.

Doors of the kind with which the present invention is concerned normally have a frame construction which comprises a plurality of frame members which are mutually fastened together, e.g. nailed, to form a door frame, to which nailing battens are firmly attached. When measured perpendicularly to the plane of the door, these nailing battens have a thickness which equals the thickness of the frame members. Battens intended to support a door-window frame when such a frame is included in the door structure are also prefixed, e.g. nailed, to adjacent frame members or nailing battens. The many cavities formed between the frame members and battens of the frame construction are filled with pieces of insulating material, possibly in conjunction with gluing a cover sheet to one flat side of the frame construction.

One drawback with the aforedescribed method of construction is that assemblage of the door frame can be both laborious and a complicated task, and necessitates the formation and manipulation of many separate insulating pieces of mutually different configuration. Nailing battens which have a thickness equal to the thickness of the frame members tend to be visible from the outside of the covering sheets, subsequent to having held together the frame structure and the cover sheets glued to the flat sides thereof in a press while the glue sets and hardens. This has the drawback of impairing the aesthetic appearance of the door, when only one side thereof is clad with an outer panel. Furthermore, such nailing battens are also capable of forming undesirable cold-bridges.

The object of the present invention is to provide a novel door construction which is an improvement on known door constructions and which will eliminate the aforesaid drawbacks, at least to a significant extent.

It is proposed in accordance with the invention that to this end the nailing batten of a door of the kind described in the introduction has a thickness which, in a manner known per se, is smaller than the thickness of the frame members and the insulating sheet respectively; that said batten is accomodated between mutually opposing frame members in a channel or groove which is preformed in a separate sheet of insulating material on the side thereof which is intended to face the wood-panel cladding and which has a depth corresponding to the thickness of the nailing batten; that the separate insulating sheet has the same thickness as the frame members surrounding the door frame; and that said sheet and frame members are joined together indirectly by virtue of being glued to two covering sheets which cover mutually opposite flat sides of the insulating sheet and the frame members. A door of this construction can be manufactured quickly and rationally with good precision. It is comparatively well insulated and nailing battens incorporated in the structure do not imprint their presence on surfaces which are not covered with an outer panel.

As beforementioned, the invention also relates to a novel and useful method for manufacturing a door which comprises a door frame having frame members which extend along the side, top and bottom edge surfaces of the door which is clad on at least one flat side thereof with an outer panel which is nailed firmly to the frame members and also to at least one nailing batten, and in which door the cavities defined between the door-frame members and the nailing batten are filled with insulating material and the insulating material and the frame-members surrounding said material are covered on each flat side with a covering sheet and glued together. The inventive method is characterized mainly by the steps of forming a free, separate sheet of insulating material which fits into and fills the space located within the door frame and the thickness of which sheet corresponds to the thickness of the door frame; providing the sheet with one or more grooves having a depth which is smaller than the thickness of said insulating sheet; forming nailing battens or strips which conform to the cross-sectional shape and the length of the groove; gluing the insulating sheet, the nailing batten located in said groove and the frame side-members to said covering sheets; and then nailing on the outer panel. This method enables the rational and economic manufcture of doors which are both aesthetic in appearance and beneficial from the aspect of thermal insulation.

Further characteristic features of the invention are set forth in the depending claims, while further advantages afforded by the invention will be apparent from the following description made with reference to the accompanying drawing.

Figure 1 is a perspective, exploded view illustrating the construction of one exemplifying embodiment of an inventive door.

Figure 2 is a perspective view of the insulating-sheet used in the door illustrated in Figure 1. Figure 3 is a perspective view of an insulating-sheet intended for use in an inventive door which is to be clad with vertically extending panel boards.

The door illustrated in a perspective, exploded view in Figure 1 comprises a door frame built from in-

dividual frame members 1-4. The door frame embraces a sheet 5 of insulating material, for instance a rigid cellular plastics material, which is a single-piece structure and the configuration of which is best seen from Figure 2. The door frame has the same thickness as the insulating sheet 5. The reference numerals 6 and 7 identify top and bottom covering sheets, which e.g. are made of plywood or a hard wood-fibre sheet material and of which the top cover sheet is intended to be clad with an outer covering panel as indicated in broken lines at 8, the outer panel of the illustrated embodiment being formed from panelling boards. The panelling boards 8 are intended to be nailed to the door-frame structure with the and of nails (not shown) which pass completely through the covering sheet 6 and into an appropriate one of the frame-members 1-4 and two nailing battens or strips 9,10. The nailing battens 9,10 have a thickness which is smaller than the thickness of the insulating sheet and are accommodated in corresponding grooves 11,12 (Figure 2) formed in the insulating sheet 5, for instance milled therein.

The side edges of the insulating sheet have formed therein rectangular recesses 13 which are intended to accommodate wooden lock mounting blocks 14 in which the door-opening and door-locking mechanism can be fitted at a later stage. The insulating sheet 5 also has formed therein an opening 15 which is fully surrounded by the insulating material and which is intended to accommodate a window frame 16 comprising four separate, identical frame-members. The window frame 16 surrounds a window opening 17 in which window glass is fitted at a later stage.

When manufacturing the door illustrated in Figure 1, the covering sheet 7 is placed on a support surface and the upper surface of said sheet is coated with glue. The insulating sheet 5 and the individual, mutually separate frame-members 1-4 are then placed on the covering sheet 7, the frame-members being supported by the edges of the sheet 5, therewith facilitating correct positioning of the door components of the sheet 7. The wooden blocks 14 are then placed in the cavities embraced by the recesses 13 and the frame-members 1,2. One of said wooden blocks may optionally be replaced with a correspondingly shaped piece of insulating material. The frame-members forming the window frame 16 are then placed in the opening 15, and the nailing battens 9,10 are placed in the grooves 11,12, said battens conforming to the shape and longitudinal extension of said grooves. The other covering sheet 6, which has been coated with glue on the undersurface thereof, is then placed over the thus assembled structure and the glue is allowed to set, preferably while applying pressure on the covering sheet 6, for instance in a press. Finally, the outer panel or panelling boards 8 is, or are, nailed to the door-frame structure with the use of nails which penetrate into the frame-members and the nailing battens. As indicated at 18, one or both of the covering sheets 6, 7 can be provided with an opening which corresponds essentially to the window opening 17.

Figure 3 illustrates an alternative embodiment of an insulating sheet 5′ which is also provided with recesses 13 for accommodating lock mounting blocks and which is intended for a door covered with vertical panelling boards. In this embodiment, the grooves 11′,12′ accommodating the nailing battens extend transversely. When the insulating sheet 5′ is intended for a door in which, for instance, vertical panelling boards are fitted on both sides thereof, grooves 11′,12′,12″ for accomodating said nailing battens are provided in both flat sides of the insulating sheet 5′, wherewith all grooves are spaced laterally from one another so as to enable one single, continuous sheet of insulating material to be used.

The invention is not restricted to the aforedescribed embodiments but can be realized in any suitable manner that lies within the scope of the inventive concept defined in the following claims.

Claims

1. A door comprising a door-frame having frame-members (1-4) which extend along the side surfaces and top and bottom edge surfaces of the door and which is clad with an outer panel (8) on at least one flat side thereof, said panel being nailed to the frame members and also to at least one nailing batten (9, 10), and in which door cavities defined between the door-frame members and the at least one nailing batten are filled with insulating material (5; 5′) in sheet form, **characterised** in that the nailing batten (9, 10) has, in a manner known per se, a thickness which is smaller than the thickness of the frame members (1-4) and the insulating sheet (5, 5′) respectively; that said batten is accommodated between mutually opposing frame members in a channel or groove (11, 12; 11′, 12′, 12″) which is preformed in a separate sheet (5, 5′) of insulating material on the side thereof which is intended to face the panel cladding (8) and which has a depth corresponding to the thickness of the nailing batten; that the separate insulating sheet (5, 5′) has the same thickness as the frame members (1-4) surrounding the door frame; and that said sheet and frame members are joined together indirectly by virtue of being glued to two covering sheets (6, 7) which cover mutually opposite flat sides of the insulating sheet and the frame members.

2. A door according to Claim 1, in which a window opening (17) provided in the door is surrounded by a window frame (16) which has the same thick-

ness as the door frame (1-4), characterized in that the window frame (16) is accommodated in an opening (15) formed in the separate insulating sheet, which opening is surrounded on all sides by the insulating material of said insulating sheet and the sides of which adjoin the outer sides of the window frame.

3. A door according to Claim 1 or 2, characterized in that the separate insulating sheet (5;5′) is provided on at least one of its edges faring towards the side edges of the door with a recess (13) intended for accommodating a wooden lock-mounting block (14).

4. A door according to Claim 2 or 3, characterized in that the window frame (16) or the separate frame-members forming said window frame and the lock-mounting block or blocks (14) are glued onto the covering sheets (6,7).

5. A door according to any one of Claims 1-4, which has an outer cladding panel (8) nailed to the door-frame members (1-4) and nailing battens on both of the flat sides of said door, characterized in that all the grooves (11′,12′,12″) in the separate insulating sheet (5′) are spared laterally from one another.

6. A method for manufacturing a door which comprises a door frame having frame members (1-4) which extend along the side, top and bottom edge surfaces of the door which is clad on at least one flat side thereof with an outer panel (8) which is nailed firmly to the frame members and also to at least one nailing batten (9, 10), and in which door the cavities defined between the door-frame members and the nailing batten are filled with insulating material (5; 5′)and the insulating material and the frame-members surrounding said material are covered on each flat side with a covering sheet(6, 7) and glued together, **characterized** by the steps of forming a free, separate sheet of insulating material (5; 5′) which fits into and fills the space located within the door frame (1-4) and the thickness of which sheet corresponds to the thickness of the door frame; providing the sheet with one or more grooves (11, 12; 11′, 12′, 12″) having a depth which is smaller than the thickness of said insulating sheet; forming nailing battens or strips (9, 10) which conform to the cross-sectional shape and the length of the groove; gluing the insulating sheet (5; 5′), the nailing battens located in said grooves (11, 12; 11′, 12′, 12″) and the frame side-members (1-4) to said covering sheets (6, 7); and then nailing on the outer panel (8).

Patentansprüche

1. Tür, die einen Türrahmen mit sich entlang der Seitenflächen und der oberen und unteren Kantenfläche erstreckenden Rahmenelementen (1-4) aufweist, und die an wenigstens einer flachen Seite mit einem Außenpaneel (8) verkleidet ist, das an die Rahmenelemente sowie an wenigstens ein Nagelbrett (9, 10) angenagelt ist, und in welcher sich zwischen den Tür-Rahmenelementen und dem betreffenden Nagelbrett befindliche Ausnehmungen mit isolierendem Material (5; 5′) in Plattenform ausgefüllt sind, dadurch gekennzeichnet, daß das Nagelbrett (9, 10) in an sich bekannter Weise eine Stärke aufweist, die geringer als die Stärke der Rahmenelemente (1-4) bzw. der isolierenden Platte (5, 5′) ist, daß das Brett zwischen einander gegenüberliegenden Rahmenelementen in einer Aussparung oder Nut (11, 12; 11′, 12′, 12″) aufgenommen ist, die in einer getrennten Platte (5, 5′) aus isolierendem Material seitlich hiervon eingeformt ist, der Paneelverkleidung (8) zugewandt ist, und eine Tiefe entsprechend der Stärke des Nagelbrettes aufweist, daß die separate isolierende Platte (5, 5′) dieselbe Stärke wie die Rahmenelemente (1-4) aufweist, die den Türrahmen umgeben, und daß die Platte sowie die Rahmenelemente indirekt miteinander zusammengefügt sind durch Verleimen mit den beiden abdeckenden Platten (6, 7), die einander gegenüberliegende flache Seiten der isolierenden Platte und der Rahmenelemente abdecken.

2. Tür gemäß Anspruch 1, wobei eine Fensteröffnung (17) in der Tür von einem Fensterrahmen (16) umgeben ist, der dieselbe Stärke wie der Türrahmen (1-4) aufweist, dadurch gekennzeichnet, daß der Fensterrahmen (16) in einer Öffnung (15) aufgenommen ist, die in der separaten isolierenden Platte eingeformt ist, und daß die Öffnung allseits von dem isolierenden Material der isolierenden Platte umgeben ist, und daß sich ihre Seiten an die Außenseiten des Fensterrahmens anschließen.

3. Tür gemäß Anspruch 1 oder 2, dadurch gekennzeichnet, daß die separate isolierende Platte (5; 5′) auf wenigstens einer Seite ihrer den Seitenkanten der Tür zugewandten kanten mit einer Ausnehmung (13) zur Aufnahme eines hölzernen, schloßaufnehmenden Blockes (14) versehen ist.

4. Tür gemäß Anspruch 2 oder 3, dadurch gekennzeichnet, daß der Fensterrahmen (16) oder die separaten Rahmenelemente, die den Fensterrahmen und den schloßaufnehmenden Block

bzw. die Blocks (14) bilden, auf die abdeckenden Platten (6, 7) aufgeklebt sind.

5. Tür gemäß einem der Ansprüche 1-4, die ein äußeres Verkleidungspaneel (8) aufweist, das auf die Tür-Rahmenelemente (1-4) und die Nagelbretter beidseits der flachen Seiten der Tür aufgenagelt ist, dadurch gekennzeichnet, daß alle Nuten (11′, 12′, 12″) in der separaten isolierenden Platte (5′) einen seitlichen Abstand voneinander aufweisen.

6. Verfahren zum Herstellen einer Tür, die einen Türrahmen mit sich entlang der Seitenfläche, der oberen und der unteren Kantenflächen der Tür erstreckende Rahmenelemente (1-4) aufweist, und die auf wenigstens einer ihrer flachen Seiten mit einem äußeren Paneel (8) verkleidet ist, das auf die Rahmenelemente fest aufgenagelt ist, sowie wenigstens auf ein Nagelbrett (9, 10), ferner mit in der Tür zwischen den Tür-Rahmenelementen und dem Nagelbrett vorgesehenen Aussparungen, die mit isolierendem Material (5; 5′) ausgefüllt sind, wobei das isolierende Material und die Rahmenelemente, die das Material umgeben, auf jeder flachen Seite mit einer Abdeckplatte (6, 7) abgedeckt und zusammengeleimt sind, gekennzeichnet durch die Schritte des Bildens einer freien, getrennten Platte aus isolierendem Material (5; 5′), die in den zwischen den Türrahmen (1-4) vorhandenen Raum pafft und diesen ausfüllt, wobei die Stärke dieser Platte der Stärke des Türrahmens entspricht; Versehen der Platte mit einer oder mehreren Nuten (11, 12′; 11′, 12′, 12″), deren Tiefe geringer als die Stärke der isolierenden Platte ist; Bilden von Nagelbrettern oder Streifen (9, 10), die der Querschnittsgestalt und der Länge der Aussparung entsprechen; Zusammenkleben der isolierenden Platte (5; 5′), der Nagelbretter in den Aussparungen (11, 12; 11′, 12′, 12″) und der Rahmen-Seitenelemente (1-4) mit den abdeckenden Platten (6, 7); und Aufnageln auf das äußere Paneel (8).

Revendications

1. Une porte comprenant un châssis de porte présentant des éléments de châssis (1-4) qui s'étendent le long des surfaces latérales et des surfaces de bords supérieur et inférieur de la porte, et qui est revêtu d'un panneau extérieur (8) sur au moins un côté plat de celui-ci, ledit panneau étant cloué aux éléments de châssis et également à au moins une baguette clouable (9, 10), et dans lequel des cavités de porte définies entre les éléments de châssis de porte et la baguette clouable sont remplies de matière isolante (5, 5′) en forme de feuille, **caractérisée** en ce que la baguette clouable (9, 10) présente, d'une manière connue en sol, une épaisseur qui est inférieure à l'épaisseur des éléments de châssis (1-4) et de la feuille isolante (5, 5′) respectivement ; en ce que ladite baguette est placée entre des éléments de châssis mutuellement opposés dans un canal ou une rainure (11, 12 ; 11′, 12′, 12″) qui est préformé dans une feuille séparée (5, 5′) de matière isolante sur son côté qui est prévu pour faire face au panneau de revêtement (8) et qui présente une profondeur correspondant à l'épaisseur de la baguette clouable ; en ce que la feuille isolante séparée (5, 5′) présente la même épaisseur que les éléments de châssis (1-4) entourant le châssis de porte ; et en ce que ladite feuille et lesdits éléments de châssis sont réunis entre eux de manière indirecte en étant collés à deux feuilles de recouvrement (6, 7) qui recouvrent des côtés plats mutuellement opposés de la feuille isolante et des éléments de châssis.

2. Une porte selon la revendication 1, dans laquelle une ouverture de fenêtre (17) prévue dans la porte est entourée par un châssis de fenêtre (16) qui présente la même épaisseur que le châssis de porte (1-4), caractérisée en ce que le châssis de fenêtre (16) est placé dans une ouverture (15) formée dans la feuille isolante séparée, ouverture qui est entourée sur tous ses côtés par la matière isolante de ladite feuille isolante et dont les côtés sont contigus aux côtés extérieurs du châssis de fenêtre.

3. Une porte selon la revendication 1 ou 2, caractérisée en ce que la feuille isolante séparée (5 ; 5′) présente, sur au moins un de ses bords dirigés vers les bords latéraux de la porte, un logement (13) destiné à la mise en place d'un bloc en bois (14) de montage d'une serrure.

4. Une porte selon la revendication 2 ou 3, caractérisée en ce que le châssis de fenêtre (16) ou les éléments de châssis séparés formant ledit châssis de fenêtre ainsi que le ou les blocs (14) de montage d'une serrure sont collés sur les feuilles de recouvrement (6, 7).

5. Une porte selon l'une quelconque des revendications 1-4, qui présente un panneau de revêtement extérieur (8) cloué aux éléments de châssis de porte (1-4) et des baguettes clouable sur les deux côtés plats de ladite porte, caractérisée en ce que toutes les rainures (11′, 12′, 12″) de la feuille isolante séparée (5′) sont écartées latéralement l'une de l'autre.

6. Un procédé de fabrication d'une porte qui

comprend un châssis de porte présentant des éléments de châssis (1-4) qui s'étendent le long des surfaces latérales, des surfaces de bords supérieur et inférieur de la porte qui est revêtue, sur au moins un côté plat de celle-ci, d'un panneau externe (8) qui est cloué fermement aux éléments de châssis et également à au moins une baguette clouable (9, 10), porte dans laquelle les cavités définies entre les éléments de châssis de porte et la baguette clouable sont remplies d'une matière isolante (5 ; 5′), la matière isolante et les éléments de châssis entourant ladite matière étant recouverts sur chaque côté plat par une feuille de recouvrement (6, 7) et collés ensemble, **caractérisé** par les opérations consistant à former une feuille libre séparée de matière isolante (5 ; 5′) qui s'adapte dans l'espace situé à l'intérieur du châssis de porte (1-4) et le remplit, l'épaisseur de cette feuille correspondant à l'épaisseur du châssis de porte ; créer sur la feuille une ou plusieurs rainures (11, 12 ; 11′, 12′, 12″) présentant une profondeur qui est inférieure à l'épaisseur de ladite feuille isolante ; former des baguettes ou bandes clouables (9, 10) qui épousent la forme en section et la longueur de la rainure ; coller la feuille isolante (5 ; 5′), les baguettes clouables situées dans lesdites rainures (11, 12 ; 11′, 12′, 12″) et les éléments latéraux de châssis (1-4) auxdites feuilles de recouvrement (6, 7) ; et clouer ensuite le panneau extérieur (8).

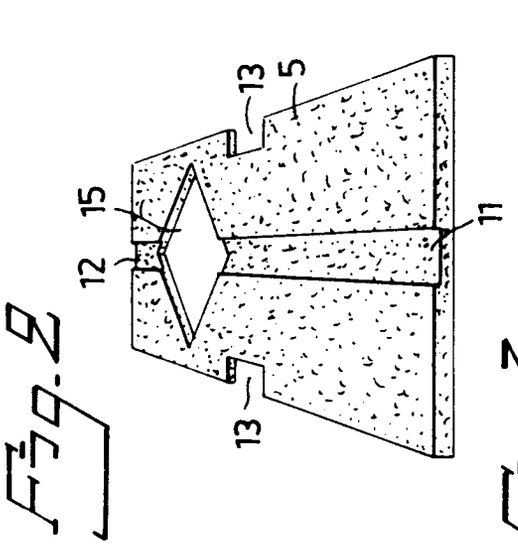

Fig. 2

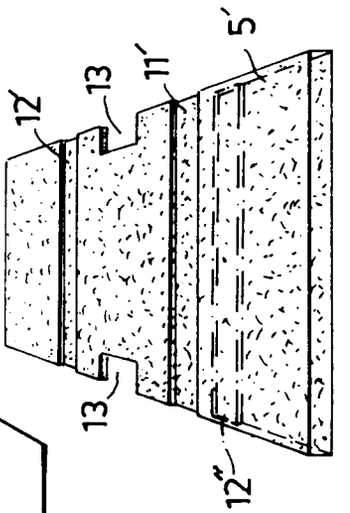

Fig. 3

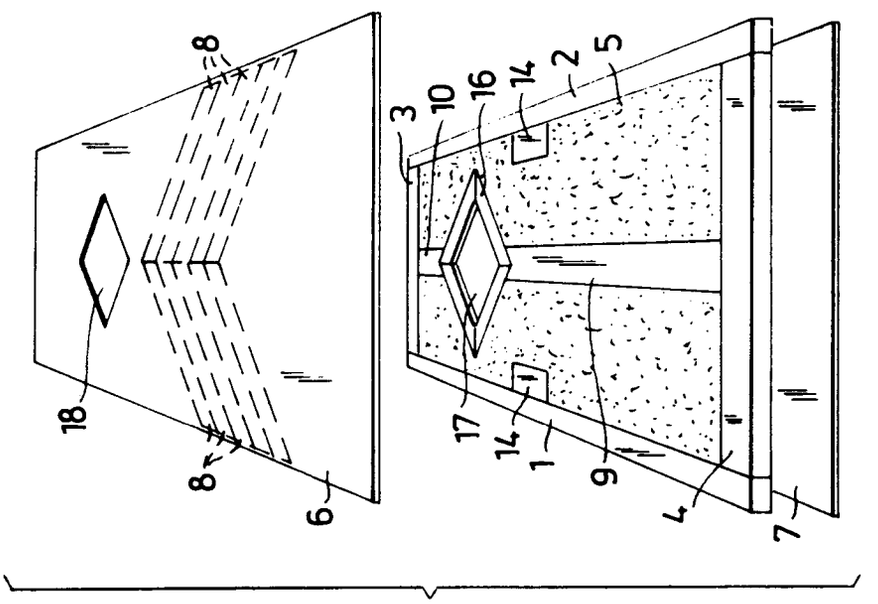

Fig. 1