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(54) **FASTENING SYSTEM FOR GLASS RAILING AND ASSOCIATED FASTENING METHOD**

(57) The present invention provides a system for fastening railing panels to a base profile. The system comprises a shim intended to be located at the bottom and against an inner wall of the channel of the base profile and support the panel at the edge and a portion of the face thereof, a first wedge and a second wedge intended to be inserted close to an opening between the face of the panel which is opposite to the face resting on the shim and an opposite inner wall of the channel, said first wedge and second wedge being configured to adjust the inclination of the panel in a first direction or in the opposite direction and fix same, wherein the vertical displacement of said first wedge and second wedge enables the adjustment of the inclination of the panel towards the shim or in the opposite direction and fixing same in the channel of the base profile.

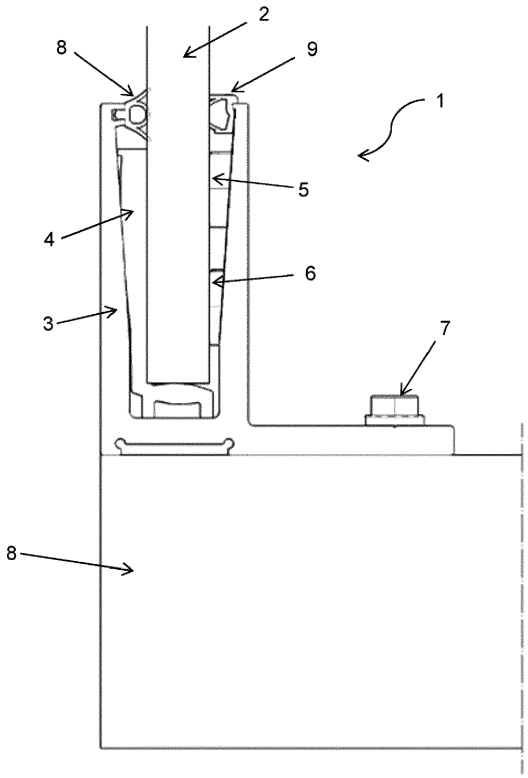

FIG. 1

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Description

TECHNICAL FIELD OF THE INVENTION

[0001] The present invention relates to a fastening system for a glass railing comprising a profile that is located, for example, on the ground, where a glass panel is fastened in a channel of the profile by means of an adjustable and adaptable shim that allows the adjustment of the inclination of the glass panel and wedges that are interposed between the guide channel of the profile and the panel, opposite to the shim, where by changing the position of said wedges, in combination with the adjustable feature of the wedge, enables the vertical alignment of the panel glass housed in the channel of the profile.

STATE OF THE ART

[0002] Glass railings are widely used in public and private buildings.

[0003] Different systems which differ mainly in how the glass panels are fixed to the guide channel of the profile are known in the state of the art. Installation and maintenance costs of glass railings vary depending on the system used. For example, the railings can be mounted in front of or above a landing, with the glass being guided in profiles located on the ground, being fixed by clamps to the side posts, the glass being supported by adapters, which are placed on the ground or on the edge of the landing, or by means of metal profiles, which are located around the glass and rest on a substructure.

[0004] In the case of mounting using a floor profile, it is known that the profiles are firmly anchored in the floor with a suitable fixing material. During the process of installing the glass of the glass railing, the installation profile is often first fixed on the ground, and then the glass is fixed in the channel of the profile to form a glass unit, where several glass units are combined to form a glass railing. However, due to the unevenness of the floor, the profile may be inclined after installation, or because the channel width of the profile is greater than the thickness of the glass, the glass of each glass unit will be inclined after installation and the glass between adjacent glass units will not be in the same plane, that is, they will not be aligned. In a real installation process, spacers are generally used to fit and hold the glass of adjacent glass units on the same surface.

[0005] Spacers commonly used in the prior art include simple square spacers. However, as square spacers have a uniform thickness, they can only fix, and cannot adjust, the angle of inclination of the glass back and forth in the longitudinal direction.

[0006] Therefore, a need to provide a system for fastening railing panels, in particular all-glass railing panels, and their components, which allows the angle of the glass panel to be adjusted, so that all glass panels that make up the railing can be perfectly aligned, has been detected. The system must be easy to manufacture, easy to operate with few components, while it must allow the handrail plates to be robustly mounted in the structure, be easy to assemble on site, and allow the vertical inclination of the plates of the handrail to be adjusted easily and preferably in a reversible manner.

DESCRIPTION

[0007] In order to provide an answer to the need found, the present invention provides a system for fastening railing panels in a base profile, as stated in the claims attached to the description.

[0008] Within the scope of the invention, a panel is defined as a flat, generally quadrangular piece having large dimensions. Therefore, within the definition of panel is a flat glass, like the typical ones used to form a glass railing.

[0009] The aforementioned system is intended to fix panels, for example, glass panels, in a base profile, wherein the base profile has a channel in which said panel is installed. The system comprises a shim intended to sit in the channel against the bottom and a side wall of said guide channel, wherein the panel is supported on said shim, the shim having a first portion configured to rest on the bottom of the channel and prepared to support the edge of the panel, and a second portion configured to rest on a side wall of the channel and support the face of the panel that is introduced into the guide channel, wherein the second portion of the shim is configured to allow the inclination of the panel.

[0010] With respect to the above, the shim has a clearance in the channel that enables the movement thereof in the channel. In particular, the first portion can be displaced relative to the bottom depending on the displacement of the second portion relative to the inner wall on which it rests. Thus, when the panel is inclined towards said second portion and the latter moves relative to the inner wall on which it rests, the first portion moves in the direction of the opposite inner wall, and vice versa.

[0011] The system also comprises a first wedge and a second wedge which are intended to be inserted one by one between the face of the panel which is opposite to the face resting on the shim in the second portion of the shim and the side wall of the channel, said first wedge and second wedge being configured to adjust the inclination of the panel with respect to the vertical and to fix same in the base profile.

[0012] Thus, by adjusting the vertical position of said first wedge and second wedge, the inclination of the panel and the fixing thereof in the base profile are adjusted. Preferably, the first wedge is located closer to the opening of the channel, while the second wedge is located closer to the bottom of the channel. Thus, when adjusting the first wedge, the panel will incline towards the shim, that is, towards the second portion of said shim and the inner wall on which the latter rests, the latter enabling the inclination of the panel in that direction, and

adjusting the second wedge will cause the panel to move in the opposite direction. Therefore, the first wedge and the second wedge can be selectively adjusted until the desired inclination or orientation of the panel is obtained, for example, with respect to the vertical, and it is fixed in the base profile.

[0013] On the other hand, the first wedge and second wedge are essentially truncated pyramidal bodies, wherein said bodies taper towards the bottom of the channel when said wedges are inserted between the face of the panel and the inner wall of said channel.

[0014] The described system has notable advantages since it is easy to manufacture, and its implementation to level and adjust each panel is simple, since it will suffice to adequately displace the first wedge and second wedge in relation to the face of the panel and the inner wall, according to the described teachings, to adjust the inclination of the panel to the desired position, fixing it in the channel of the base profile.

[0015] With the system as described thus far, it is possible to adjust the inclination of the panel if this is required for aesthetic reasons or, for example, if the installation ground for installing the base profile is not perfectly level and it is necessary to adjust this unevenness so that the panel is aligned with the vertical.

[0016] In addition to the foregoing, in another embodiment the system is designed to form railings, each railing comprising at least one panel or a series of panels arranged adjacent to each other at their edges, wherein at least one of the panels in the railing is fixed by means of the system for fastening railing panels according to the described teachings.

BRIEF DESCRIPTION OF THE FIGURES

[0017] The foregoing and other advantages and features will be more fully understood from the following detailed description of exemplary embodiments with reference to the accompanying drawings, which should be considered by way of illustration and not limitation, wherein:

- Figure 1 is a side view of the system of the invention applied to adjust the inclination and fix a panel to a base profile.
- Figure 2 is a side view of the shim of the system in which the elements making up same can be seen in greater detail.
- Figure 3 is a side view of a base profile in which the system is used to adjust the inclination and fix a panel.

DETAILED DESCRIPTION OF AN EXEMPLARY EMBODIMENT

[0018] In the following detailed description, numerous specific details are set forth in the form of examples to provide a thorough understanding of the relevant teachings. However, it will be apparent to those skilled in the art that the present teachings can be implemented without such details.

[0019] As seen in figure 1, the present invention provides a system for fastening railing panels 2 to a base profile 3, hereinafter, system 1 onwards.

[0020] Generally, the base profile 3 is arranged on a ground 8 with a level surface, making appropriately located and spaced holes along the base profile 3, wherein the base profile 3 is fixed to the ground 8 by means of bolts 7. It is important to note that other ways of fixing the base profile 3 to the ground 8 are contemplated within the scope of the invention.

[0021] As seen in Figure 3, the base profile 3 comprises a channel 30 that has an opening 31, a bottom 32 and inner walls 33, 34. In the base profile 3 illustrated in Figure 3, the channel 30 has a V-like shape with a flattening that forms the bottom 32, essentially vertical sections extending from the bottom 32 and inclined sections extending from the vertical sections and oriented towards the opening 31.

[0022] Prior to inserting panel 2 into channel 30, a shim 4 is arranged in said channel 30 which, in the illustrated embodiments, is essentially L-shaped, wherein the shim 4 is essentially L-shaped and comprises a first portion 41 that corresponds to the horizontal section of said L shape, and a second portion 42 that corresponds to the vertical section of said L shape. As seen in Figure 1, the shim 4 has a clearance with respect to channel 30, such that it can move relative to said channel 30 when panel 4 is inclined in one direction or another to adjust its alignment with respect to, for example, the vertical.

[0023] As can be seen in figure 2, the first portion 41 is configured to rest on the bottom 32 of the channel 30 and is prepared to support the panel 2 at the edge, said first portion 41 having a clearance with respect to the bottom 32 and the verticals walls projecting from same, which enables it to be displaced relative to said bottom 32.

[0024] On the other hand, the second portion 42 is configured to rest on one of the inner walls 33 of the channel 30 and support a portion of the face of the panel 2 that is introduced into the guide channel 30, as seen in Figure 1. In this sense, the second portion 42 comprises a face 43 that is intended to rest on the inner wall 33 of the channel, said face 43 having a convex region 44 which rests on the inner wall 33 of the channel 30 and enables the pivoting of the shim 4 with respect to said inner wall 33, such that, accordingly, the first portion 41 is displaced with respect to the bottom 32 by the action of pivoting.

[0025] Therefore, the second portion 42 is configured to allow the inclination of the panel 2 towards the inner wall 33 on which said second portion 42 rests. In this sense, the second portion 42 pivots with respect to the internal wall 33 when the panel 2 is inclined towards said second portion 42, that is, towards the internal wall 33 or, as indicated, towards the shim 4.

[0026] As mentioned in previous paragraphs, the first portion 41 can be displaced relative to the bottom 32

depending on the pivoting of the second portion 42 relative to the inner wall 33 on which it rests. Thus, when the panel 2 is inclined towards said second portion 42 and the latter moves relative to the inner wall 333 on which it rests, the first portion 41 moves in the direction of the opposite inner wall 34, and vice versa.

[0027] On the other hand, as can be seen in Figure 1, the system 1 also comprises a first wedge 5 and a second wedge 6 which are each designed to be inserted between the face of panel 2 opposite to the face resting on the second portion of the shim 4 and the inner wall 34 of the channel 30, said first wedge 5 and second wedge 6 being configured to adjust the inclination of the panel 2, for example, in reference to the vertical, and to fix same in the base profile 3.

[0028] The first wedge 5 is intended to be inserted close, that is, closer to the opening 31, while the second wedge 6 is intended to be inserted close, that is, closer to the bottom 32, as seen in Figure 1.

[0029] In order to adjust the inclination of the panel 2, for example, in relation to the vertical and leave it completely vertical, the first wedge 5 and the second wedge 6 are displaced appropriately in the insertion between the panel 2 and the inner wall 34. By adjusting the first wedge 5 in the direction of the bottom 32, the panel 2 is inclined towards the shim 2, that is, towards the inner wall 33 on which the second portion 42 rests, due to the pivotability of said second portion 42, while by adjusting the second wedge 6 in the direction of the bottom 32, the panel 2 is inclined in the opposite direction, that is, towards the inner wall 34, opposite to the wall on which the second portion 42 of the shim 4 rests.

[0030] Therefore, by appropriately moving the first wedge 5 and the second wedge 6, it is possible to orient the panel 2 towards the required inclination position, while at the same time it is fixed in the channel 30 of the base profile 3.

[0031] In a particular embodiment, the first wedge 5 and the second wedge 6 comprise essentially truncated pyramidal bodies, wherein in the insertion between the face of the panel 2 opposite to the face resting on the second portion 42 of the shim 4 and the inner wall 34 of the channel 30, said first wedge 5 and second wedge 6 tapering towards the bottom 32 of channel 30.

[0032] In a preferred embodiment, and due to the arrangement in the insertion of the first wedge 5 and the second wedge 6, the first wedge 5 is larger, having larger dimensions than the second wedge 6.

[0033] Preferably, to proceed with the mounting of the panel 2 in the base profile 3, the shim 4 is introduced into the guide channel 30 of the base profile 3, longitudinally centering the shim 4 in relation to the axial axis of the screw 7, and the first wedge 5 and the second wedge 6 are arranged side by side, aligning the common side in relation to the axial axis of the screw 7.

[0034] The mounting of the panel 2 is completed with a first glazing joint 8 and second glazing joint 9 that are arranged opposite one another in the mouth 31 of the channel 30, wherein the first glazing joint 8 is preferably placed after introducing the shim 4, while that the second glazing joint 9 is placed once the panel 2 has been adjusted in the required position.

[0035] Although in the preferred embodiment described thus far two wedges have mainly been used to adjust the inclination and fix the panel to the base profile, the person skilled in the art will see this as not limiting, since it could be possible to use more than two wedges, under the described teachings, in order to adjust the inclination and fix a panel to the base profile.

[0036] In a non-illustrated embodiment, the present invention discloses a railing made up of at least one panel 2, or of a series of panels 2 arranged adjacent to each other at their edges, wherein at least one of said panels 2 in the railing is fixed by means of the system 1 for fastening panels 2 according to the teachings described thus far.

Claims

1. A system (1) for holding railing panels (2) in a base profile (3) which comprises a channel (30) that has an opening (31), a bottom (32) and inner walls (33) (34), the system (1) **characterized in that** it comprises:

   - a shim (4) intended to be located at the bottom (32) and against an inner wall (33) of the channel (30) and support the panel (2) at the edge and a portion of the face thereof, the shim (4) being configured to enable the inclination of the panel (2);
   - a first wedge (5) intended to be inserted close to the opening (31) between the face of the panel (2) which is opposite to the face resting on the shim (4) and the opposite inner wall (34) of the channel (30), said first wedge (5) being configured to adjust the inclination of the panel (2) in a first direction and to fix same; and
   - a second wedge (6) intended to be inserted close to the bottom (32) between the face of the panel (2) which is opposite to the face resting on the shim (4) and the opposite inner wall (34) of the channel (30), said second wedge (6) being configured to adjust the inclination of the panel (2) in a second direction opposite to the first direction and to fix same;

   wherein the vertical displacement of said first wedge (5) and second wedge (6) enables the adjustment of the inclination of the panel (2) towards the shim (4) or in the opposite direction and fixing same in the channel (30) of the base profile (3).

2. The system according to claim 1, wherein the shim (4) comprises:

- a first portion (41) configured to rest on the bottom (32) of the channel (30) and prepared to support the edge of the panel; and
- a second portion (42) configured to rest on one of the side walls (33) of the channel (30) and support the face portion of the panel (2) that is introduced into the guide channel (30), wherein the second portion (42) is configured to allow the inclination of the panel (2) towards the inner wall (33) on which said second portion (42) rests.

3. The system according to claim 2, wherein the shim (4) is essentially L-shaped wherein the first portion (41) corresponds to the horizontal section of said L shape, while the second portion (42) corresponds to the vertical section of said L shape.

4. The system according to any of the preceding claims, wherein the first wedge (5) and second wedge (6) comprise essentially truncated pyramidal bodies, wherein said bodies taper towards the bottom (32) of the channel (30) when said first wedge (5) and second wedge (6) are inserted between the face of the panel (2) and the inner wall (34) of said channel (30).

5. A railing comprising a series of panels (2) arranged adjacent to each other at their edges, the railing being **characterized in that** at least one of said panels (2) is fixed by means of the system (1) for fastening railing panels (2) according to any of claims 1 to 4.

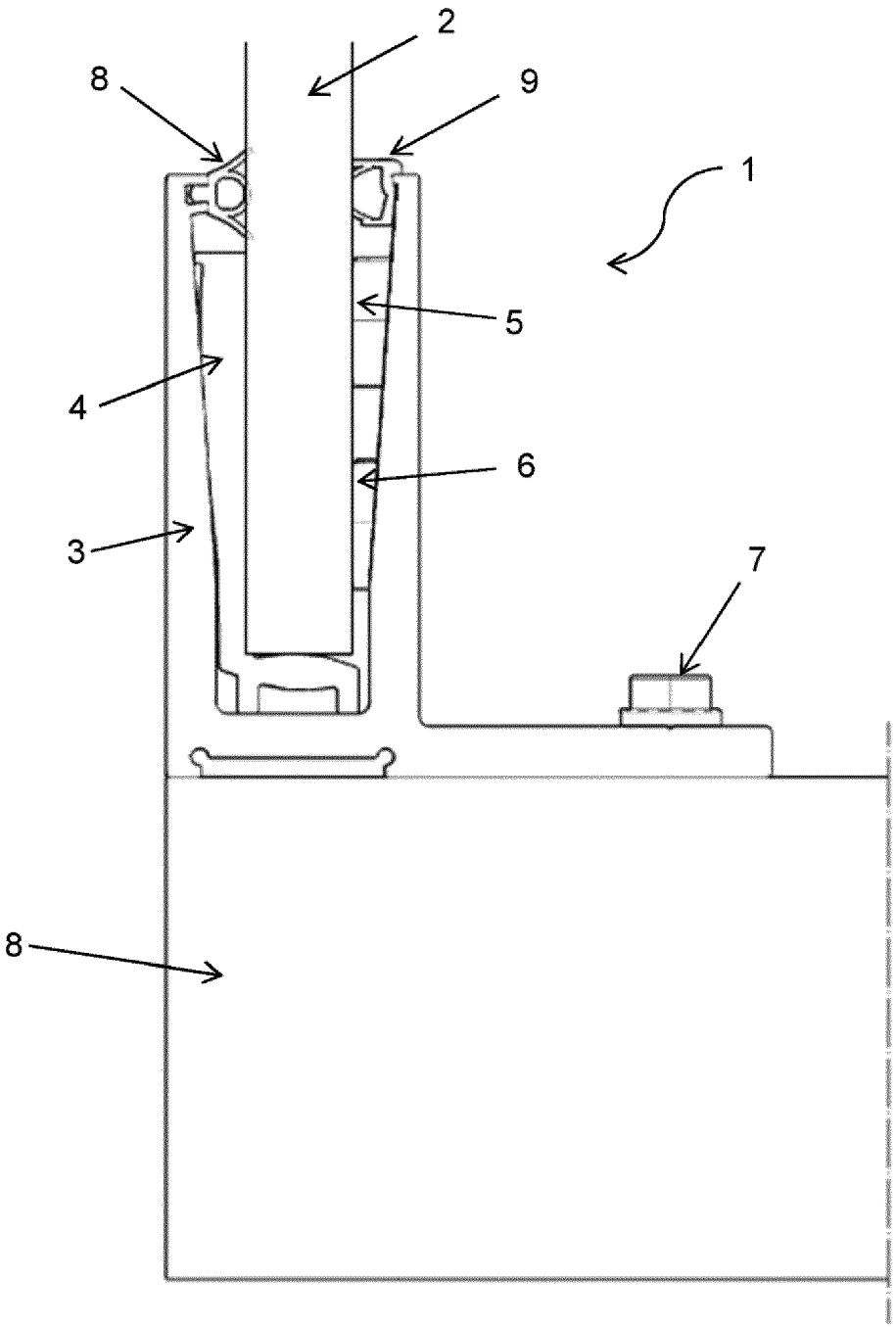

FIG. 1

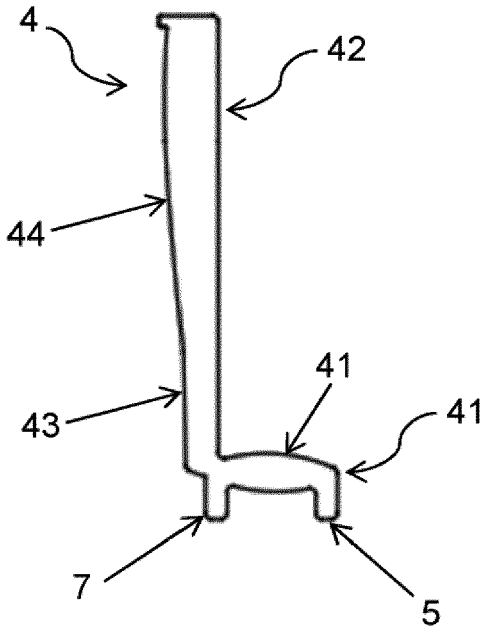

FIG. 2

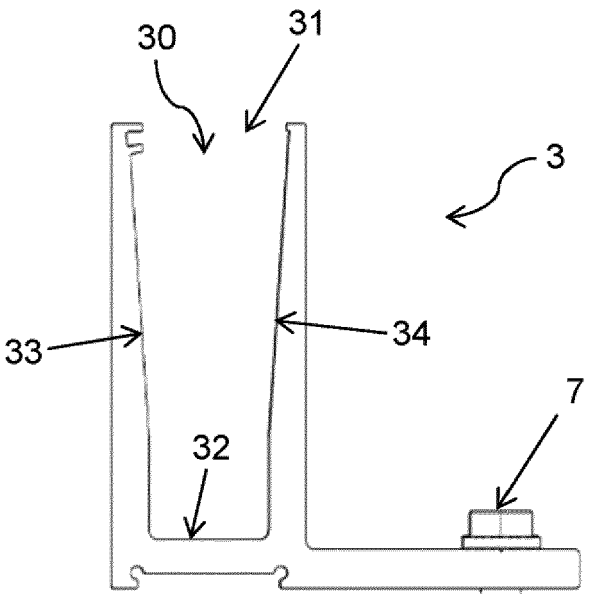

FIG. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 23 38 2847

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 20 2014 100164 U1 (RAILING EUROP GMBH & CO KG Q [DE]) 3 April 2014 (2014-04-03) * figure 1 *	1-5	INV. E04F11/18
X	DE 10 2021 100069 A1 (GLOCKNER DIETER [DE]) 7 July 2022 (2022-07-07) * figure 1 *	1-5	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	29 January 2024	Fournier, Thomas

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
O : non-written disclosure
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E : earlier patent document, but published on, or after the filing date
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 23 38 2847

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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29-01-2024

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 202014100164 U1	03-04-2014	NONE	
DE 102021100069 A1	07-07-2022	NONE	

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82