

(12) UK Patent Application (19) GB (11) 2 142 588 A

(43) Application published 23 Jan 1985

(21) Application No 8412766

(22) Date of filing 18 May 1984

(30) Priority data

(31) 67614 (32) 2 Jun 1983 (33) IT

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(51) INT CL³
B62D 21/02

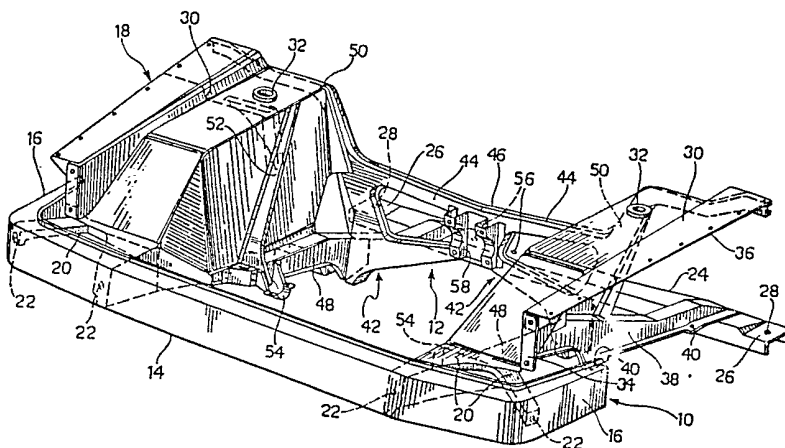
(52) Domestic classification
B7B 254 260 CM

(56) Documents cited
None

(58) Field of search
B7B

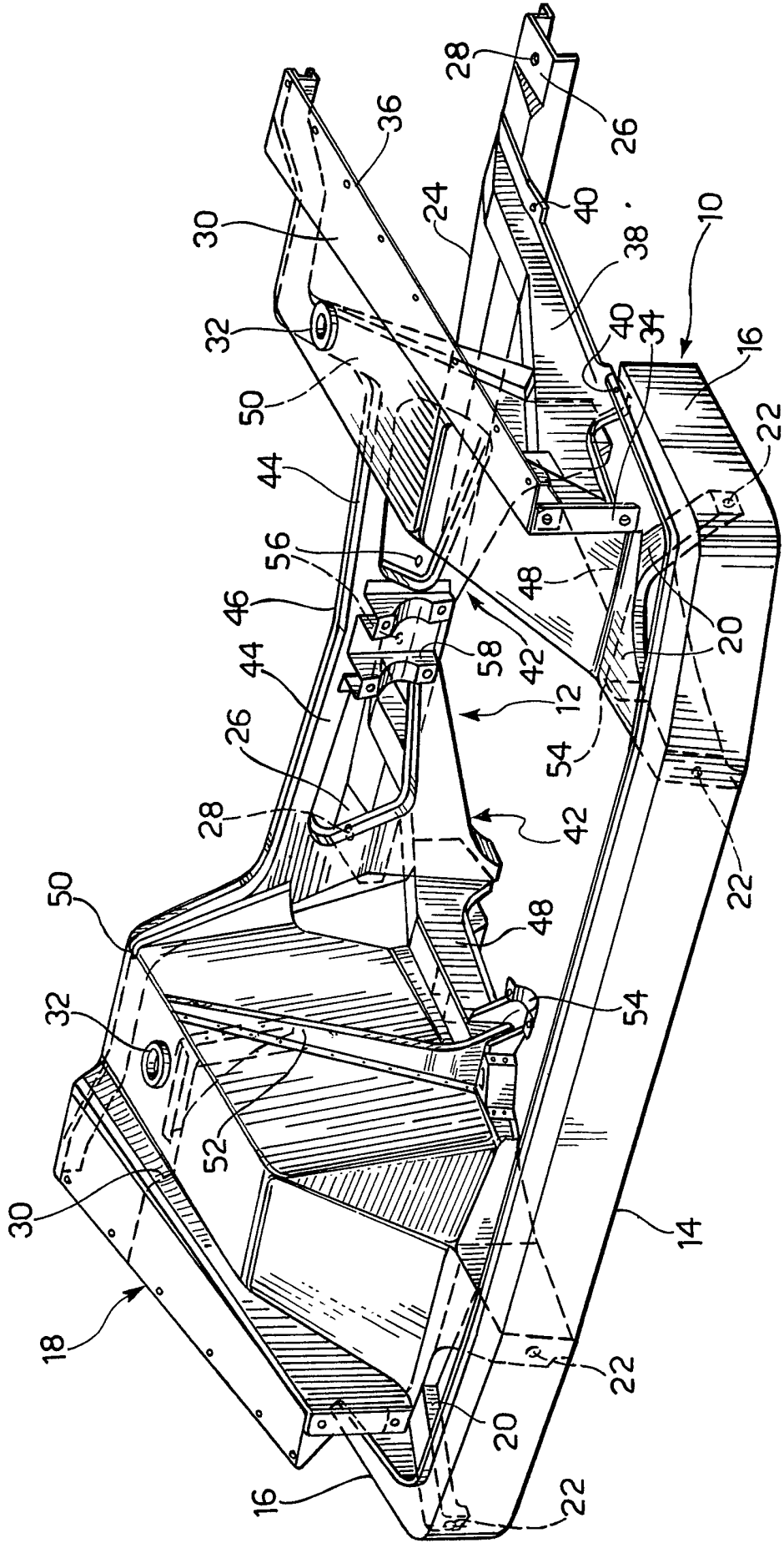
(54) Modular front frame for motor vehicles

(57) A modular front frame for a motor vehicle comprises an outer structure 10 including a front cross member 14 having parts 20 for the attachment of a bumper, a rear cross member 24 with ends 28 for fixing it to opposite sides of the floor, and two side elements 18 interconnecting the cross members 14,24 and each including a wheel arch 30 with parts 34,36 for fixing it to one side and to the front of the bodywork and parts 32,40 for anchoring the suspension of a front wheel. The frame further includes a generally U-shaped internal structure 12 the side arms 48 of which are fixed to the side elements 18 of the outer structure 10 and carry respective attachments 54 for the suspension mounts for the engine, and the base 46 of which is fixed to the rear cross member 24 and has attachment parts 58 for the steering system of the vehicle.



GB 2 142 588 A

1/1



SPECIFICATION

Modular front frame for motor vehicles

5 The present invention relates to a modular front frame for motor vehicles, characterised in that it comprises an outer structure including a front cross member having parts for the attachment of a bumper, a rear cross member with ends for fixing it to the opposite sides of the floor of a motor vehicle, and two side elements interconnecting the front cross member and the rear cross member and each including a wheel arch with parts for fixing it to one side and to the front of the bodywork of the vehicle, and parts for anchoring the suspension of a front wheel, and a generally U-shaped internal structure the side arms of which are fixed to the side elements of the outer structure and carry respective attachments for suspension mounts for the engine of the vehicle, and the base of which is fixed to the front cross member and has an attachment part for the steering system of the vehicle.

The modular frame according to the invention has the advantage over prior frames of conventional type of allowing the complete pre-assembly of all the front mechanical members (engine, front suspension, radiator, steering system, etc.) and structural parts of the body (front cross member, internal wheel arches, front with lights, bumper, and front wings). This avoids the installation of the engine on the assembly line and the adjustment of the toe-in of the wheels in a pit.

Moreover, the modular frame according to the invention is designed so that may frontal collision of the vehicle to which it is applied will be absorbed by the buckling of the internal wheel arches and not by the internal structure of the frame carrying the mount for the engine, so as to discharge the collision on the sides of the floor of the vehicle through the rear cross member without affecting the hinges of the vehicle doors and thus avoiding the risk of jamming.

According to the invention, the internal structure is constituted by two box members each of which includes a rear part defining a frame structure with the rear part of the other box member, and a substantially horizontal branch and a substantially vertical branch, projecting substantially perpendicular to the frame element and fixed to the respective wheel arch.

The invention will now be described in detail with reference to the appended drawing which is a schematic perspective view of a modular front frame for a motor vehicle, according to the invention.

The frame illustrated in the drawing comprises essentially an outer structure 10 and an internal structure 12 fixed within the outer structure 10.

The outer structure 10 is constituted by a front cross member 14 with curved ends 16 close to which are fixed two side elements 18 with front ends provided with forked parts 20 for the attachment at 22 of the front bumper of a vehicle, and rear ends connected to a rear cross member 24. The latter has recessed ends 26 for its fixing at 28 to lateral reinforcing members (ribs) of the floor of the vehicle.

The centre of each side element 18 is shaped into a wheel arch 30 the upper part of which has an attachment 32 for the shock-absorber of one of the front wheels of the vehicle and, along its respective front and outer side edges, has respective attachment parts 34, 36 for the front and for one of the wings of the vehicle bodywork. In the zone underlying the wheel arch 30, each side element 18 defines a side frame 38 fixed close to one of the ends 26 of the cross member 24 and provided with attachment parts 40 for the suspension members of the corresponding front wheel of the vehicle.

The internal structure 12 is formed by two box members 42 which are fixed rigidly together and each of which includes a rear part 44, which defines with the rear part 44 of the other box member 42 a frame structure 46 located immediately in front of the cross member 24, and two arms 48, 50 which extend substantially perpendicular of the frame structure 46 towards the front member 14 and upwardly, respectively. The arms 48 are fixed to the bases of the two wheel arches 30, while the arms 50 are connected to the rear ends of the latter.

The arms 48, close to their front ends from which extend vertical strengthening elements 52 fixed to the wheel arches 30, carry respective attachments 54 for the side mounts of the suspension of the engine of the vehicle, while the central part of the rear cross member 24 is arranged to receive at 56 a rear suspension mount for the engine. Moreover, the middle portion of the frame structure 46 has an attachment element 58 for the steering box of the vehicle.

Thus, in practice, the internal structure 12 has a generally U-shaped configuration behind the front cross member 14 so as to be protected by the latter in the event of a frontal collision of the vehicle to which the frame is applied in use. Consequently, any frontal collision is absorbed by the buckling of the side elements 18 and particularly the two wheel arches 30, without affecting the internal structure 12 the function of which is limited solely to supporting the engine of the vehicle. The effects of any frontal collision are thus discharged by the cross member 24 to the lateral reinforcements for the floor of the vehicle, without affecting the zones of hinging of the doors to the bodywork of the vehicle and thus reducing the risk of these doors jamming.

It will be clear from the above that the frame according to the invention advantageously allows the complete pre-assembly of all the front mechanical members (engine, front suspensions, steering, etc.) and the bodywork parts (front cross member, internal wheel arches, front with lights, bumper and front wings) of the vehicle, which, by definition, simplifies the assembly of the vehicle by eliminating the installation of the engine on the assembly line and the adjustment of the toe-in of the wheels in the pit.

Naturally, the principle of the invention remaining the same, the constructional details and the embodiments may be varied widely with respect to that described and illustrated, without thereby departing from the scope of the present invention.

CLAIMS

1. Modular front frame for motor vehicles characterised in that it comprises an outer structure (10) including a front cross member (14) having parts (22) for the attachment of a bumper, a rear cross member (24) with ends (26) for fixing it to the opposite sides of the floor of a motor vehicle, and two side elements (18) interconnecting the front cross member (14) and the rear cross member (24) and each including a wheel arch (30) with parts (36, 34) for fixing it to one side and to the front of the bodywork of the vehicle, and parts (32, 40) for anchoring the suspension of a front wheel, and a generally U-shaped internal structure (12) the side arms (48, 50) of which are fixed to the side elements (18) of the outer structure (12) and carry respective attachments (54) for suspension mounts for the engine of the vehicle, and the base (46) of which is fixed to the front cross member (24) and has an attachment part (58) for the steering system of the vehicle.
2. Frame according to Claim 1, characterised in that the internal structure (12) is constituted by two coupled box members (42) each of which includes a rear part (44) which defines a frame structure (46) with the rear part (44) of the other box member (42), and a substantially horizontal arm (48) and a substantially vertical arm (50), projecting substantially perpendicular to the frame element (46) and fixed to the respective wheel arch (30).
3. Frame according to Claim 1 or Claim 2, characterised in that the rear cross member (24) has central attachments (56) for a rear suspension mount for the engine of the vehicle.
4. Frame substantially as described with reference to the appended drawing.
5. Any novel feature or combination of features described herein.