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(71) Applicant: **TSUDAKOMA KOGYO KABUSHIKI KAISHA**
Kanazawa-shi Ishikawa-Ken (JP)

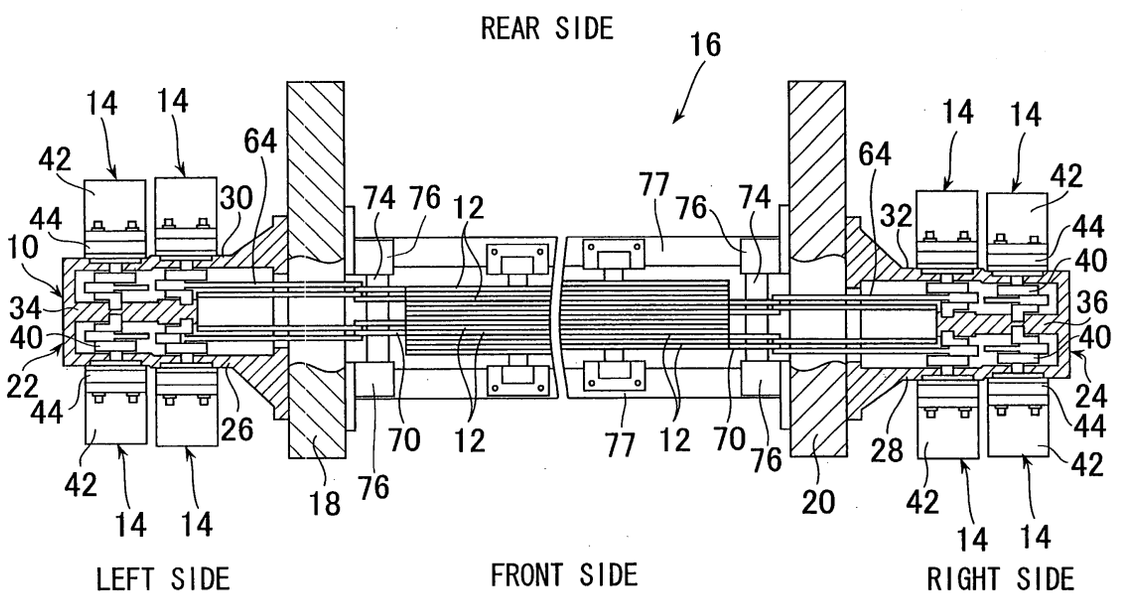
(72) Inventor: **Hirai, Jun**
Ishikawa-gun Ishikawa-ken (JP)

(74) Representative:
von Samson-Himmelstjerna, Friedrich R., Dipl.-Phys. et al
SAMSON & PARTNER
Widenmayerstrasse 5
80538 München (DE)

(54) Shedding device of loom

(57) A shedding device (10) of a loom (16) comprises a plurality of drive mechanisms (14) provided in one-to-one correspondence to a plurality of heald frames (12). Each drive mechanism (14) includes: a rotary drive source (42); a speed reducer (44) having a reduction shaft (48) connected to an output shaft (50) of the rotary drive source (42) and driven by decelerating a rotation of the output shaft (50) and attached to a shedding device frame (22, 24) different from a loom frame; a bearing (38) disposed in the shedding device frame (22, 24); and a motion converting mechanism (46) having a rod (64) connected to the heald frames (12) and a rotary member (40) and for converting a rotational motion of the reduction shaft (48) into a linear reciprocal motion of the rod (64) through the rotary member (40). The rotary member (40) has a one end portion (54) connected to the reduction shaft (48), the other end portion (56) supported by the bearing (38), and an intermediate portion (58) which is located between the one end portion (54) and the other end portion (56) and to which the rod (64) is swingably connected.

FIG. 1



EP 1 477 598 A2

Description

Field of the Invention

[0001] The present invention relates to a shedding device for forming warp shed in a loom.

Description of the Prior Art

[0002] Patent Document 1 discloses a shedding device comprising a plurality of drive mechanisms provided in one-to-one correspondence to a plurality of heald frames. In this prior art, each of the drive mechanism includes a rotary drive source attached to a shedding device frame, and a motion converting mechanism having a rod connected to heald frames as well as rotary members and for converting a rotational motion of an output shaft of the rotary drive source into a linear reciprocal motion of the rod through the rotary members. One end of the rotary member is assembled into the output shaft of the rotary drive source so as not to relatively rotate. Also, the one end of the rotary member is supported by the output shaft of the rotary drive source in a cantilever-like manner.

Patent Document 1

[0003] Japanese Patent Appln. Public Disclosure No. 2002-129446 Official Gazette (Fig. 5 and Fig. 6)

[0004] The foregoing shedding device does not dispose a so-called speed reducer between the rotary drive source and the heald frame. Also, since there is need to vertically move the heald frame at a high speed so as to improve the productivity of the loom, the rotary drive source uses an exclusive electric motor of a high torque and having an excellent performance in responsiveness. There is a problem that such a rotary drive source is expensive to make the production of the loom costly.

[0005] In the foregoing shedding device, reaction force due to warp tension is applied to the rotary member through the rod from the heald frame, and a bearing inside the rotary drive source receives the reaction force from the heald frame concentrically. Consequently, a joint for assembling the rotary member and the output shaft of the rotary drive source so as not rotate relatively bends upon receipt of the reaction force from the heald frame. Also, due to the joint's deflection, the rotation center axis of the rotary member becomes eccentric, thereby vibrating the shedding device. As a result, there are problems that a stabilized warp shedding cannot be obtained and, further, the bearing inside the rotary drive source wears abnormally.

SUMMARY OF THE INVENTION

[0006] An object of the present invention is to suppress a production cost of a loom and obtain more stable warp shedding motion in a shedding device for driving each heald frame through a motion converting mechanism converting a rotational motion of rotary drive sources provided in one-to-one correspondence to heald frames into a linear reciprocal motion.

[0007] A first shedding device of a loom, comprising a plurality of drive mechanisms provided in one-to-one correspondence to a plurality of heald frames. Each drive mechanism includes a rotary drive source, a speed reducer, a bearing and a motion converting mechanism. The speed reducer is attached to a shedding device frame. The speed reducer has a reduction shaft connected to an output shaft of the rotary drive source to be driven for deceleration by rotation of the output shaft. The bearing is disposed in the shedding device frame. The motion converting mechanism has a rod connected to the heald frame, and a rotary member. The motion converting mechanism converts a rotational motion of the reduction shaft into a linear reciprocal motion of the rod through the rotary member. The rotary member has one end portion connected to the reduction shaft, the other end portion supported on the bearing, and an intermediate portion located between the one end portion and the other end portion. The rod is swingably connected to the intermediate portion.

[0008] It is possible that the shedding device frame is disposed in one of the outsides of the heald frames in the cloth width direction and has a side wall extending in the cloth width direction. The plural rotary drive sources are arranged in plural rows on the side wall. The speed reducer is attached to the side wall. The reduction shaft penetrates the side wall.

[0009] A second shedding device of a loom, comprising a plurality of first drive mechanisms provided in one-to-one correspondence to a plurality of heald frames, and a plurality of second drive mechanisms provided in one-to-one correspondence to another plurality of heald frames. Each of the first drive mechanisms includes a first rotary drive source, a first speed reducer, a first bearing and a first motion converting mechanism. The first speed reducer is attached to a first shedding device frame. The first speed reducer has a first reduction shaft connected to a first output shaft of the first rotary drive source to be driven for deceleration by rotation of the first output shaft. The first bearing is disposed in the first shedding device frame. The first motion converting mechanism has a first rod connected to the heald frame, and a first rotary member. The first motion converting mechanism converts a rotational motion of the first reduction shaft into a linear reciprocal motion of the first rod through the first rotary member. Each of the second drive mechanisms includes a second rotary drive source, a second speed reducer, a second bearing, a second motion converting mechanism. The second speed reducer is attached to a second shedding device frame. The second speed reducer has a second reduction shaft connected to a second output shaft of the second rotary drive source to be driven for deceleration by rotation of the second output shaft. The second bearing

is disposed in the second shedding device frame. The second motion converting mechanism has a second rod connected to the heald frame, and a second rotary member. The second motion converting mechanism converts a rotational motion of the second reduction shaft into a linear reciprocal motion of the second rod through the second rotary member. Each of the first rotary members has a first one end portion connected to the first reduction shaft, a first other end portion supported by the first bearing, and a first intermediate portion which are located between the first one end portion and the first other end portion and to which the first rod is swingably connected. Each of the second rotary members has a second one end portion connected to the second reduction shaft, a second other end portion supported by the second bearing, and a second intermediate portion which are located between the second one end portion and the second other end portion and to which the second rod is swingably connected. The first and second shedding device frames are respectively arranged in one and the other outsides of the heald frames in the cloth width direction and have a first and second side walls extending in the cloth width direction. The first rotary drive sources and the second rotary drive sources are arranged respectively in a plurality of rows on the first and second side wall of the corresponding first and second shedding device frame. Each of the first and second speed reducers is attached respectively to the first and second side wall of the corresponding first and second shedding device frame. Each of the first and second reduction shafts penetrates respectively the first and second side wall of the corresponding first and second shedding device frame.

[0010] In the second shedding device, it is possible that the plurality of first drive mechanisms are made to correspond to the heald frame on the side near a cloth fell and a plurality of the heald frames adjacent thereto and successive and that the another plurality of second drive mechanisms are made to correspond to the heald frame adjacent to the rearmost end of the successive heald frames and the plural heald frames adjacent thereto and successive.

[0011] The second shedding device may further comprise a plurality of third drive mechanisms provided in one-to-one correspondence to the other plural heald frames. In this case, each of the third drive mechanism includes a third rotary drive source, a third speed reducer, a third bearing and a third motion converting mechanism. The third speed reducer attaches to the first shedding device frame. The third speed reducer has a third reduction shaft connected to a third output shaft of the third rotary drive source to be driven for deceleration by the third output shaft. The third bearing is disposed in the first shedding device frame. The third motion converting mechanism has a third rod connected to the heald frames, and a third rotary member. The third motion converting mechanism converts a rotational motion of the third reduction shaft into a linear reciprocal motion of the third rod through the third rotary member.

[0012] In the above-mentioned shedding device, said third rotary member may further have a third one end portion connected to said third reduction shaft, the third other end portion supported on said third bearing, and a third intermediate portion which is located between said third one end portion and said third other end portion and to which said third rod is swingably connected. The first shedding device frame may have a third side wall opposite to the first side wall and extending in the cloth width direction. Third rotary drive sources may be arranged in a plurality of rows in the third side wall. Each third speed reducer may be attached to the third side wall. Each third reduction shaft may penetrate the third side wall.

[0013] In the second shedding device, the plural first drive mechanisms may correspond to the first heald frame on the side near a cloth fell and the plural first heald frames adjacent thereto and successive. The plural second drive mechanisms may correspond to the second heald frame adjacent to the rearmost end of the successive first heald frames and the plural second heald frames adjacent thereto and successive.

[0014] In the second shedding device, the first and third bearings may be supported by the first shedding device frame through a common bearing support portion.

[0015] A third shedding device according to the present invention comprises a plurality of first drive mechanisms provided in one-to-one correspondence to a plurality of heald frames, and a plurality of second drive mechanisms provided in one-to-one correspondence to a plurality of heald frames. Each of the first drive mechanisms includes a first rotary drive sources, a first speed reducer being, a first bearing and a first motion converting mechanism. The first speed reducer is attached to the shedding device frame. The first speed reducer has a first reduction shaft connected to a first output shaft of the first rotary drive source to be driven for deceleration by rotation of the first output shaft. The first bearing is disposed in the shedding device frame. The first motion converting mechanism has a first rod and a first rotary member. The first rod is connected to the heald frame, the first motion converts mechanism converting a rotational motion of the first reduction shaft into a linear reciprocal motion of the first rod through the first rotary member. Each of the second drive mechanisms includes a second rotary drive source, a second speed reducer, a second bearing and a second motion converting mechanism. The second speed reducer is attached to the shedding device frame. The second speed reducer has a second reduction shaft connected to a second output shaft of the second rotary drive source to be driven for deceleration by rotation of the second output shaft. The second bearing is disposed in the shedding device frame. The second motion converting mechanism has a second rod and a second rotary member, the second rod being connected to the heald frame. The

second motion converting mechanism converts a rotational motion of the second reduction shaft into a linear reciprocal motion of the second rod through the second rotary member. The first rotary member has a first one end portion connected to the first reduction shaft, a first other end portion supported by the first bearing, and a first intermediate portion which is located between the first one end portion and the first other end portion and to which the first rod is swingably connected. The second rotary member has a second one end portion connected to the second reduction shaft, a second other end portion supported by the second bearing, and a second intermediate portion which is located between the second one end portion and the second other end portion and to which the second rod is swingably connected. The shedding device frame has first and second side walls which are disposed in one of the outsides of the heald frames in the cloth width direction and which are opposed to each other at an interval in the back and forth direction and extending in the cloth width direction. Each of the first rotary drive sources and each of the second rotary drive sources are arranged respectively in a plurality of rows on the first and second side walls. Each of the first speed reducers and each of the second speed reducers are attached respectively to the first and second side walls. Each of the first reduction shafts and each of the second reduction shafts penetrate respectively the first and second side walls.

[0016] In the third shedding device, the plural first drive mechanisms may correspond to the first heald frame on the side near a cloth fell and the plural first heald frames adjacent thereto and successive. The plural second drive mechanisms may correspond to the second heald frame adjacent to the rearmost end of the successive first heald frames and the plural second heald frames adjacent thereto and successive.

[0017] In the third shedding device, the first and second bearings may be supported by the shedding device frame through a common bearing support portion.

[0018] In each shedding device, the axis of each reduction shaft may be parallel to the axis of the output shaft of the corresponding rotary drive source.

[0019] In each shedding device, each rotary drive source and the corresponding axis may share the axes of the output shaft and the bearing, and the axis of each intermediate portion may be made eccentric to the corresponding common axis.

[0020] In each shedding device, each rotary member may have a substantially circular shape as viewed in the direction of its rotation axis and may be an eccentric cam to which the intermediate portion is eccentrically connected.

[0021] In the first, second and third shedding devices, each drive mechanism is provided with a speed reducer between the rotary drive source and the motion converting mechanism. It is, therefore, not required to use an expensive rotary drive source having a high torque and excellent responsiveness, so that the production cost of the loom is reduced.

[0022] In the first, second and third shedding devices, each drive mechanism receives reaction force from the heald frame in the intermediate portion of the rotary member. In each drive mechanism, however, the rotary member is supported at its one end portion and other end portion on both sides of its intermediate portion like, a beam supported at its both ends by posts, on the shedding device frame through the speed reducer and the bearing.

[0023] As mentioned above, in case the rotary member is supported in the shedding device frame at both sides of the intermediate portion which receives reaction force from the heald frame, like a center crank supported at its both ends, the rigidity of the drive mechanism is raised, can make the heald frame performing stable shedding motion without being affected by vibration and the like of the loom, and moreover, even if the speed reducer is disposed between the rotary drive source and the heald frame, force acting on the reduction shaft of the speed reducer is reduced by half, so that the bearing inside the speed reducer is durable.

[0024] Further, in the second shedding device, by making the plural first drive mechanisms correspond to the heald frame on the side near the cloth fell as well as the heald frames adjacent thereto and successive and making the plural second drive mechanisms correspond to the heald frame adjacent to the rearmost end of the heald frames corresponding to the first drive mechanisms as well as the heald frames adjacent thereto and successive, the heald frames corresponding to the first drive mechanisms are arranged in series and then the heald frames corresponding to the second drive mechanisms are arranged in series, thereby enabling to arrange the heald frames of the second drive mechanisms in a space in the back and forth direction for disposing the bearing corresponding to the first drive mechanism. Therefore, in comparison with a case of making the heald frames correspond alternately to the first and second drive mechanisms disposed on the right and left of the cloth width in order from the front side, shortening of an arrangement pitch of the heald frames becomes possible, thereby reducing stress on the warp.

[0025] Also, in the second shedding device, as regards making the plural third drive mechanisms correspond to the heald frame adjacent to the rearmost end of the heald frames corresponding to the second drive mechanisms and the plural heald frames adjacent thereto and successive, and in the third shedding device according to the present invention as mentioned above, as regards making the plural first drive mechanisms correspond to the heald frame on the side near the cloth fell and the plural heald frames adjacent thereto and successive while making the plural second drive mechanisms correspond to the heald frame adjacent to the rearmost end of the heald frames corresponding to the first drive mechanisms and the plural heald frames adjacent thereto and successive, in comparison with a

case of making the heald frames in order from the front side correspond alternately to respective drive mechanisms disposed on the right and left sides in the cloth width direction or in the back and forth direction of the cloth fell, the arrangement pitch of the heald frames can be shortened, thereby reducing stress on the warp.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026]

Fig. 1 is a plan view of a loom provided with the shedding device of the first embodiment according to the present invention, wherein a drive mechanism and a crank rod are omitted in part.

Fig. 2 is a horizontal sectional view of the shedding device shown in Fig. 1.

Fig. 3 is a front elevation of the loom shown in Fig. 1, wherein some drive mechanisms and crank rods are omitted.

Fig. 4 is a front elevation of the loom shown in Fig. 1, wherein the other drive mechanisms and crank rods are omitted.

Fig. 5 is a schematic plan view showing an example of transformation of the shedding device shown in Fig. 1.

Fig. 6 is a schematic plan view showing another example of transformation of the shedding device shown in Fig. 5.

Fig. 7 is a schematic plan view showing still another example of transformation of the shedding device shown in Fig. 6.

Figs. 8 (A) and (B) are fragmentary sectional views showing an example of transformation of the rotary member of the shedding device shown in Fig. 1, in which (A) is a view of the rotary member as viewed from back and forth direction and (B) is a view of the rotary member as viewed from the vertical direction.

Fig. 9 is a schematic plan view showing still another example of the shedding device shown in Fig. 7.

Fig. 10 is a schematic plan view showing yet another example of transformation of the shedding device shown in Fig. 9.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0027] In this embodiment, "back and forth direction" means the moving direction of the warp by letting off of the warp, "vertical direction" the moving direction of the heald frames, "cloth width direction" and "rightward and leftward direction" the running direction of the weft (rightward and leftward direction as viewed from the downstream side in the moving direction of the warp). Also, "front side" and "rear side" respectively means the downstream side and upstream side in the moving direction of the warp.

[0028] Referring to Figs. 1 through 4, a shedding device 10 comprises a plurality of drive mechanisms 14 provided in one-to-one correspondence to a plurality of heald frames 12.

[0029] As shown in Fig. 1, the shedding device 10 is used as an electric shedding device for forming warp shedding by reciprocating in the vertical direction a plurality of heald frames 12 arranged between loom frames 18 and 20 located on the right and left sides of a loom 16 together with the healds arranged in the heald frames 12.

[0030] As shown in Figs. 1, 3 and 4, in this embodiment, the loom 16 is provided with, for example, sixteen heald frames 12. Consequently, the shedding device 10 has sixteen drive mechanisms 14 made to correspond to heald frames 12 individually.

[0031] As shown in Fig. 1, the shedding device 10 comprises shedding device frames 22 and 24 different from right and left loom frames 18, 20 of the loom 16. The shedding device frames 22 and 24 are respectively disposed in the outsides of the loom frames 18 and 20, and are firmly assembled into the corresponding loom frames 18 and 20 through fixing means (not shown).

[0032] The shedding device frames 22, 24 have a hollow, substantially rectangular shape when their planar sectional shape extending in the rightward and leftward direction and the back and forth direction are viewed from the vertical direction. The shedding device frames 22 and 24 respectively have front side walls 26 and 28 as well as rear side walls 30 and 32 extending in the rightward and leftward direction and the vertical direction (perpendicularly to the moving direction of the warp).

[0033] The front side walls 26 and 28 are respectively opposed by the rear side walls 30 and 32. The drive mechanisms 14 shown in the drawings, divided into in four sets each including four, are attached to the front side walls 26 and 28 and the rear side walls 30 and 32 of the shedding device frames 22 and 24.

[0034] The shedding device frames 22 and 24 respectively have support walls 34 and 36. The support walls 34 and 36 respectively extend from a left-side connection wall and a right-side connection wall for connecting the front side walls 26 and 28 and the rear side walls 30 and 32 of the shedding device frames 22 and 24, passing between the front side walls 26 and 28 and the rear side walls 30 and 32, toward the hollow portions (i.e., inside) of the shedding device frames 22 and 24. Each of the support walls 34, 36 supports a plurality of rotary members 40 through respective bearings 38.

[0035] Each drive mechanism 14 includes a rotary drive source 42, a speed reducer 44, the bearings 38, and a motion converting mechanism 46. In this embodiment, each rotary drive source 42 uses exclusive electric motors provided in one-to-one correspondence to the heald frame 12.

[0036] As shown in Fig. 2, each drive mechanism 14 decelerates rotational speed of an output shaft 50 of the

rotary drive source 42 by a speed reducer 44, and rotates the rotary member 40 about the axis of an reduction shaft 48, following rotation of the reduction shaft 48 of the speed reducer 44.

[0037] Each rotary drive source 42 is controlled separately from a main shaft drive motor which drives the main shaft of the loom 16, but its output shaft 50 is synchronously rotated with the rotation of the main shaft.

[0038] More particularly, each rotary drive source 42 is connected to a shedding controller (not shown) to which a rotational angle signal of the main shaft is to be inputted. In the shedding controller, with the shedding motion taken into account, drive amount patterns to be set in correspondence to the rotational angles of the main shaft of the loom are preset and stored. The shedding controller drives each rotary drive source 42 synchronously with the rotation of the main shaft, based on the drive amount patterns.

[0039] The speed reducer 44 has in its inside a plurality of reduction gears 52 meshing with each other and transmits the rotation of the output shaft 50 of the rotary drive source 42 to the reduction shaft 48 by decelerating by the reduction gear 52.

[0040] More particularly, each reduction shaft 48 is rotatably supported in the speed reducer 44 through the bearing 38. In other words, each reduction shaft 48 is supported in the shedding device frame 22 or 24 through the speed reducer 44. At one end of each reduction shaft 48, the reduction gears 52 of the last stage are assembled so as not to rotate relatively. Rotational motion of the output shaft 50, decelerated through a plurality of reduction gears 52 of the speed reducer 44, is transmitted to the reduction shaft 48.

[0041] The other end of each reduction shaft 48 penetrates each of the front and rear side walls 26, 28, 30 and 32 of the shedding device frames 22 and 24, and is provided so as to extend toward the insides of the shedding device frames 22 and 24. The speed reducer 44, however, may be a publicly known speed reducer other than a gear-meshing one, e.g., a speed reducer using a timing pulley and a timing belt.

[0042] The four speed reducers 44 are attached to each outside surface of the front side wall 26 and the rear side wall 30 of each of the shedding device frames 22 and 24, two each on the right and left sides each in the upper and lower two rows.

[0043] Each speed reducer 44 is disposed such that the axis of the reduction shaft 48 becomes parallel to the axis of the output shaft 50 of the rotary drive source 42. By this, an area required for attaching the speed reducer 44 and rotary drive source 42 to the corresponding front and rear side walls 26, 28, 30 or 32 can be made small, so that they can be arranged efficiently.

[0044] The rotary member 40 has a crank-like shape, with both ends in its axial direction as one end portion 54 and the other end portion 56 and with the portion between the one end portion 54 and the other end portion 56 as an intermediate portion 58.

[0045] The one end portion 54 of the rotary member 40 is connected to the reduction shaft 48 by publicly known connecting means so as not to rotate relatively. Concretely, a fitting hole 60 is formed at the one end portion 54, and the front end of the reduction shaft 48 is fitted into the fitting hole 60 so as not to rotate relatively. It is, however, possible to connect the rotary member 40 and the reduction shaft 48 by another means such as a publicly known coupler which projects a cylindrical portion at the front end of the one end portion 54, or to connect by forming the reduction shaft 48 integrally with the one end portion 54 of the rotary member 40.

[0046] The other end portion 56 of each rotary member 40 is rotatably fitted into the bearing 38 which is fitted into a bearing hole 62 provided in the support wall 34 or 36. Each bearing hole 62 supports in common the bearings 38 and 38 which respectively support the other end portion 56 of the rotary member 40 provided in the front side wall 26 or 28 and the other end portion 56 of the rotary member 40 provided in the rear side wall 30 or 32.

[0047] Each rotary member 40 is formed such that the axes of its one end portion 54 and other end portion 56 coincide with both axes of the reduction shaft 48 and the bearing 38 and that the intermediate portion 58 is eccentric from those axes.

[0048] Each crank rod 64 is pivotally connected to the intermediate portion 58 at its one end portion by a bearing 66 so that the crank rod 64 is swung by a rotational motion of the rotary member 40. The rotary member 40 and crank rod 64 constitute a crank mechanism for converting a rotational motion of the rotary drive source 42, in turn, the speed reducer 44 into a linear reciprocal motion in the rightward and leftward direction.

[0049] As shown in Figs. 3 and 4, each heald frame 12 is supported in a support mechanism 68 provided in each heald frame 12 and moved in the vertical direction by the rotary drive source 42 (in other words, the drive mechanism 14) provided in each heald frame 12 through the support mechanism 68. By this, a warp shedding is formed.

[0050] Respective support mechanisms 68 include a pair of right and left swing levers 70 rotatable around the axis of a support shaft 74 which is provided at intervals in the cloth width direction and extending in the back and forth direction, and a connection rod 72 for connecting both swing levers 70 to each other. Each support mechanism 68 is disposed below the corresponding heald frame 12.

[0051] Fig. 3 shows the four swing levers 70 individually corresponding to the four rotary drive sources 42 provided in the front side wall 26 which is located on the left side as viewed from the front side. Fig. 4 shows the four swing levers 70 individually corresponding to the four rotary drive sources 42 provided in the front side wall 28 which is located on the right side as viewed from the front side.

[0052] Each swing lever 70 is supported at the base portion, i.e., branch portion of the V-shape so as to swing

within a plane extending in the vertical direction as well as in the rightward and leftward direction in a support shaft 74 common to the plural support mechanisms 68. Both support shafts 74 are provided at intervals from each other in the cloth width direction (rightward and leftward direction) between the loom frames 18 and 20 and extend in the back and forth direction. Each support shaft 74 is supported on the loom frames 18 and 20 through brackets 76, 76 (see Fig. 1) which are assembled into a pair of understeers 77, 77 (see Fig. 1) installed in the lower portion between the loom frames 18 and 20 so as not to move relatively.

[0053] Both swing levers 70 of each support mechanism 68 are pivotally connected at one arm portion to a connection rod 72 and pivotally connected at the other arm portion to a support body 78. Each support body 78 connecting the swing levers 70 to the heald frames 12 is adapted as a connection rod with a one end portion of a screw rod screwed into a tapped hole of a long female screw body.

[0054] Each support mechanism 68 receives the reciprocal motion converted by the rotary member 40 as well as the crank rod 64 in the swing lever 70 on the side (left side or right side) nearer the corresponding drive mechanism 14. This makes both swing levers 70 swing in synchronism to move in the vertical direction both support bodies 78 in synchronism.

[0055] Concretely, the left swing lever 70 in Fig. 3 and the right swing lever 70 in Fig. 4 further have integrally an arm portion 80 extending in a circular arc shape within a plane extending in the vertical direction as well as in the rightward and leftward direction, and are pivotally connected in this arm portion 80 to the other end portion of the crank rod 64.

[0056] The range of a swinging angle (stroke amount) of the swing lever 70 is adjusted by changing an assembled position where the crank rod 64 is assembled into the arm portion 80.

[0057] As shown in Fig. 1, the sixteen heald frames 12 are divided into four heald frame groups with adjoining four heald frames 12 as one heald frame group. Respective heald frame groups are the first, second, third and fourth heald frame groups from the front side (the cloth fell side) in order in the back and forth direction.

[0058] Respective heald frames 12 of the first, second, third and fourth heald frame groups are made to correspond to the rotary drive sources 42 provided in the front side wall 28 of the shedding device frame 24, the front side wall 26 of the shedding device frame 22, the rear side wall 32 of the shedding device frame 24 and the rear side wall 30 of the shedding device frame 22.

[0059] Consequently, the plural drive mechanisms 14 provided in the front side wall 28 are made to correspond individually to the heald frames 12 of the first heald frame group (namely, the heald frame 12 on the side nearest the front side wall 28 and three heald frames 12 adjacent thereto and successive, that is, when heald frame Nos. are given as 1, 2, ... from the front side in order, the heald frames 12 from frame No. 1 to No. 4).

[0060] The plural drive mechanisms 14 provided in the front side wall 26 are made to correspond individually to the heald frames 12 of the second heald frame group (namely, the heald frame 12 adjacent to the rearmost end of the first heald frame group and three heald frames 12 adjacent thereto and successive, that is, the four heald frames 12 from frame No. 5 to No. 8).

[0061] The plural drive mechanisms 14 provided in the rear side wall 30 are made to correspond individually to the heald frames 12 of the third heald frame group (namely, the heald frame 12 adjacent to the rearmost end of the second heald frame group and three heald frames 12 adjacent thereto and successive, that is, the four heald frames 12 from frame No. 9 to No. 12).

[0062] The plural drive mechanisms 14 provided in the rear side wall 32 are made to correspond individually to the heald frames 12 of the fourth heald frame group (namely, the heald frame 12 adjacent to the rearmost end of the third heald frame group and three heald frames 12 adjacent thereto and successive, that is, four heald frames 12 from frame No. 13 to No. 16).

[0063] Also, in the example shown in Fig. 4, respective heald frames 12 of the first and third heald frame groups are connected to the rotary drive sources 42 which are provided on the lower left, lower right, upper left and upper right of the front side wall 28 and rear side wall 32 as viewed from the front side in the back and forth direction in order from the side near the front side wall 28 and rear side wall 32. However, as long as the rotary member 40 and crank rod 64, etc. constituting the adjoining drive mechanisms 14 do not collide with each other following their rotational motion or swing motion, the relation in correspondence between each heald frame 12 and each drive mechanism 14 can be made arbitrarily.

[0064] More particularly, the four drive mechanisms 14 provided in the front side wall 28 on the right side (namely, the drive mechanisms individually corresponding to the first heald frame group) are made to correspond to four heald frames 12 in total from No. 1 heald frame 12 at the front end (namely, the side nearest the cloth fell) and the No. 2 through No. 4 heald frames 12, on the other hand, the four drive mechanisms 14 provided in the front side wall 26 on the left side (namely, the drive mechanisms individually corresponding to the second heald frame group) are made to correspond to four heald frames 12 in total, that is, No. 5 heald frame 12 adjacent to No. 4 heald frame 12 at the rearmost end corresponding to the front side wall 28 on the right side as well as No. 6 to No. 8 heald frames 12 adjacent thereto and successive.

[0065] The four drive mechanisms 14 provided in the rear side wall 32 on the right side (namely, the drive mechanisms individually corresponding to the third heald frame group) are made to correspond to four heald frames 12 in total from No. 9 heald frame 12 ad-

jacent to the No. 8 heald frame 12 at the rearmost end corresponding to the front side wall 26 on the left side as well as No. 10 to No. 12 heald frames 12 adjacent thereto and successive, on the other hand, the four drive mechanisms 14 provided in the rear side wall 30 on the left side (namely, the drive mechanisms individually corresponding to the fourth heald frame group) are made to correspond to four heald frames 12 in total from No. 13 heald frame 12 adjacent to No. 12 heald frame 12 at the rearmost end corresponding to the rear side wall 32 on the right side as well as No. 14 to No. 16 heald frames 12 adjacent thereto and successive.

[0066] Consequently, for example, a distance L between No. 4 heald frame 12 at the rearmost end of the first heald frame group and No. 9 heald frame 12 at the most front end of the third heald frame group is to be of the same or larger dimension as the total dimension of the thickness dimensions of respective heald frames 12 from No. 5 to No. 8 heald frames of the second heald frame group. Also, since each of the intermediate portion 58 of the rotary member 40 is located in the rightward and leftward direction of the corresponding heald frame 12 (see Fig. 1), the bearing 38 supporting the rotary member 40 is located on the side of the hollow portion (namely, the side opposite to the drive mechanism 14) of the shedding device frame 22 rather than the position in the rightward and leftward direction of the heald frame 12.

[0067] In other words, the positions of the bearings 38 corresponding to No. 4 and No. 9 heald frames 12 are between imaginary plane extending in the vertical direction as well as in the rightward and leftward direction from No. 4 heald frames 12 and imaginary plane extending in the vertical direction as well as in the rightward and leftward direction from No. 9 heald frames 12. By this, the distance L is made equal to or more than the thickness dimension T in the back and forth direction of the support wall 34 which supports the bearings 38 corresponding to No. 4 and No. 9 heald frames 12.

[0068] Here, a shedding device with one heald frame 12 allocated to each heald frame group, namely, a shedding device with drive mechanisms 14 corresponding to frame Nos. 1, 2, 3, 4, 5, ... heald frames 12 assembled into the right front side wall 28, left front side wall 26, right rear side wall 32, left rear side wall 30, right front side wall 28, ... can be supposed. However, when the drive mechanisms 14 are arranged in such a manner, for example, the support wall 36 supporting the bearings 38 corresponding to frame Nos. 1 and 3 heald frames 12 must be arranged between Nos. 1 and 3 heald frames 12 (namely, in the arrangement pitch of the heald frames 12). Also, in view of a restriction for designing that the thickness of the support walls 34, 36 or the bearings 38 requires a certain thickness, the arrangement pitch of the heald frames 12 should be made large.

[0069] In the shedding device with one heald frame 12 allocated to respectively to side walls 26, 28, 30, 32 in order from the front side, as mentioned above, the arrangement pitch between adjoining heald frames 12 becomes larger than the arrangement pitch in the above-mentioned embodiment when the support walls are disposed in the hollow portion locate between the shedding device frames 22 and 24. Consequently, in such shedding device, it is necessary to make the momentum (amount of shedding) the larger, the farther disposed the heald frames 12 are from the cloth fell, in order to ensure the running path of the warps required for weft insertion. As a result, the warps corresponding to the heald frames 12 near the cloth fell. Such damage causes stoppage, thereby bringing about such problems as lowering of operability of the loom 16 or an increase in warp breaking.

[0070] The shedding device 10 shown in Fig. 1, however, has four or so heald frames 12 as a heald frame group correspond to the drive mechanisms 14 on one side wall. For this reason, for example, the support wall 36 for receiving both rotary member 40 provided in the front side wall 28 and rotary member 40 provided in the rear side wall 32 can be formed within an imaginary disposing space extending in the vertical direction as well as in the rightward and leftward direction from the frame Nos. 5 and 8 heald frames 12 corresponding to the front side wall 26.

[0071] Consequently, the shedding device 10 can utilize a space for accommodating of the support wall 36 within a range not enlarging the arrangement pitch of the heald frames 12 more efficiently than the arrangement pitch of the heald frames 12 in case of a shedding frame having one heald frame 12 allocated to each heald frame group in order from front side to rear side, and the dimension of the space in the back and forth direction can be shortened. Consequently, the shedding device 10 does not cause any problem such as giving an excessive damage to the warp, lowering the rate of operation or increasing warp breakage. Furthermore, since the rotary member 40 is supported at both end portions by the shedding device frames 22 or 24 at both sides of the intermediate portion 58 which receives reaction force from the heald frames 12, the rigidity of the drive mechanism 14 is raised, and the shedding device 10 dominates in that it is not affected by vibration or the like of the loom 16.

[0072] The number of the heald frames 12 to correspond to the drive mechanisms 14 on one side wall 36 actually becomes four or more because of restriction for designing relative to the heald frames 12. If, however, thinning of the heald frames 12 can be realized, the number may be less than that. If the number of the heald frames 12 is decreased and the total length of the rotary member 40 in the direction of the rotation axis is shortened, deflection of the rotary member 40 which received reaction force such as a warp tension can be made small. For this reason, it is possible to make it hard for the shedding device 10 to generate a vibration because of a rotational motion by the rotary member 40 in a bended state, thereby realizing a shedding motion with a little

vibration.

[0073] The above-mentioned shedding device 10, each drive mechanism 14 having the speed reducer 44 between the rotary drive source 42 and the heald frames 12, does not need to use an expensive rotary drive source which has a high torque and an excellent responsiveness, so that the production cost of the loom 16 is more curtailed.

[0074] Also, each drive mechanism 14 receives the reaction force from the heald frames 12 in the intermediate portion 58 of the rotary member 40. The rotary member 40 of each drive mechanism 14, however, is supported at one end portion 54 and the other end portion 56 on both sides of its intermediate portion 58 in the shedding device frame 22 or 24, like a beam supported at both ends, respectively through the speed reducer 44 and bearing 38. Therefore, advantages such as follows also arise.

[0075] The rigidity of the drive mechanism 14 is raised, a stable shedding motion can be performed by the heald frames 12 without influence by vibration or the like of the loom 16, and, even if the speed reducer 44 is disposed between the rotary drive source 42 and the heald frames 12, force acting on the reduction shaft 48 of the speed reducer 44 is reduced to half, so that the bearing 38 inside the speed reducer 44 becomes long-lived.

[0076] The above-mentioned shedding device 10 can be transformed as follows.

[0077] The shedding device 10 shown in Fig. 5 has twenty-four heald frames 12. Each of the first, second, third and fourth heald frame groups has six heald frames 12. In Fig. 5, the rotary drive sources 42 are arranged in two upper and lower rows, or three or more thereof each on the right and left sides.

[0078] The shedding device 10 has the rotary drive sources 42 on each of the rear side walls 30 and 32. Depending on the specification of a cloth, however, the number of the heald frames 12 may be sometimes eighteen. In such a case, the shedding device 10 may dispense with the heald frames 12 indicated by dotted lines and the speed reducers 44 corresponding thereto in order from the rear side.

[0079] Respective drive sources 42 of the shedding device 10 are arranged so as to be behind in the back and forth direction relative to the rotary drive sources 42 adjacent to the corresponding front and rear side walls 26, 28, 30 or 32. The front and rear side walls 26 and 30 as well as 28 and 32 facing each other are arranged like a flight of steps such that the nearer the side walls to the loom frames 18 and 20, the wider the intervals in the back and forth direction.

[0080] The shedding device frames 22 and 24 may be arranged respectively in either one of the loom frames instead of outside the loom frames 18 and 20.

[0081] Likewise, the plural drive mechanisms 14 may be arranged on either one of the side walls instead of the front and rear side walls 26, 30 or 28, 32 of the shedding device frames 22 or 24.

[0082] For example, as shown in Fig. 9, the speed reducer 44 can be assembled into the front side wall 28 and the rear side wall 32 of the shedding device frame 24 disposed on the right side of the loom frame 20. In this case, the bearings 38 receiving the rotary member 40 to be driven by each speed reducer 44 attached to the front side wall 28 and the rear side wall 32 are respectively disposed at the positions of the rear side wall 32 and the front side wall 28 opposite to the position of the speed reducers 44 assembled into the front side wall 28 and the rear side wall 32. For this reason, the rotary member 40 to be rotated is supported at both ends by the two side walls 28, 32 through the bearings 38.

[0083] As shown in Fig. 6, the speed reducers 44 can be assembled separately into the front side walls 26 and 28 of the shedding device frames 22 and 24, or can be assembled separately into the rear side walls 30 and 32 of the shedding device frames 22 and 24, as shown in Fig. 7.

[0084] As shown in Fig. 10, it is also possible to have a constitution in which the drive mechanism 14 disposed on the left side relative to the loom frame 18 shown in Fig. 6 and the drive mechanism 14 disposed on the right side relative to the loom frame 20 shown in Fig. 7 are combined.

[0085] The shedding device fames 22, 24 may be attached above the loom frames 18, 20 like a mounting-type dobby.

[0086] The number of the heald frames 12 is not limited to sixteen, eighteen, twenty-four, and so on, but can be more or less. The number of the heald frames 12 are preferably in a range of eight to twenty-four. In this case, the number of the speed reducers 44 to be attached to the front side walls 26, 28 and the rear side walls 30, 32 is increased or decreased in accordance with the number of the heald frames 12. Consequently, the shedding device frames 22, 24 are formed so as to enable to mount the number of speed reducers 44 corresponding to the number of the heald frames 12.

[0087] The shedding device frames 22, 24 are formed in a rectangular (box-like) shape, but are not limited to that shape. It is possible to make the front side walls 26, 28, the rear side walls 30, 32, and the support walls 34, 36 of separative members and assemble them with fixing means.

[0088] While, in the illustration, one bearing hole 62 is formed so as to receive the other end portions 56 of the two rotary members 40 arranged to be adjacent in the back and forth direction, it is possible to make one bearing hole 62 receive the other end portion 56 of one rotary member 40.

[0089] As regards the internal constitution of the speed reducer 44, while in the illustration a plain gear, in which the axis of the output shaft 50 and the axis of the reduction shaft 48 become parallel, is used, it is possible to have both axes intersect by using a bevel gear.

[0090] As shown in Figs. 8 (A) and (B), the rotary

member 40 may be one which has an eccentric shaft 84 fit to a support shaft 82. In the example shown in Figs. 8 (A) and (B), the one end portion 54 of the support shaft 82 is assembled into the reduction shaft 48 so as not to rotate relatively. The other end 56 of the support shaft 48 is supported by the bearing 38 so as not to rotate relatively.

[0091] Also, in the example shown in Figs. 8 (A) and (B), the eccentric shaft 84 is assembled into potion between the one end portion 54 and the other end portion 56 of the support shaft 82 by a key 86 so as not to rotate relatively. The outer periphery of the eccentric shaft 84 as viewed from the axial direction of the support shaft 82 is circular-shaped. Consequently, both of the support shaft 82 and the eccentric shaft 84 which is provided firmly together with the support shaft 82 correspond to the rotary members 40, and the eccentric shaft 84 corresponds to the intermediate portion 58 acting as a so-called eccentric cam with its eccentric center being eccentric to the support shaft 82. The outer periphery of the eccentric shaft 84 and a hole formed at one end portion of the crank rod 64 are connected by fitting.

[0092] In the example shown in Fig. 8, when the support shaft 82 is rotated, the eccentric shaft 84 is rotated about the support shaft 82 to swing and reciprocate the crank rod 64. For a mechanism for converting a rotational motion of the rotary member 40 into a linear reciprocal motion, it is possible to use a publicly known mechanism, besides the illustrated one.

[0093] The present invention is not limited to the foregoing embodiments but can be variously changed without departing from its spirit.

Claims

1. A shedding device (10) of a loom (16), comprising a plurality of drive mechanisms (14) provided in one-to-one correspondence to a plurality of heald frames (12),

wherein each drive mechanism (14) includes: a rotary drive source (42); a speed reducer (44) attached to a shedding device frame (22, 24), said speed reducer (44) having a reduction shaft (48) connected to an output shaft (50) of said rotary drive source (42) to be driven for deceleration by rotation of said output shaft (50); a bearing (38) disposed in the shedding device frame (22, 24); and a motion converting mechanism (46) having a rod (64) and a rotary member (40), said rod (64) being connected to said heald frame (12), said motion converting mechanism (46) converting a rotational motion of said reduction shaft (48) into a linear reciprocal motion of said rod (64) through said rotary member (40); and

wherein said rotary member (40) has one end portion (54) connected to said reduction shaft (48), the other end portion (56) supported on said bearing (38), and an intermediate portion (58) located between said one end portion (54) and said other end portion (56) and to which said rod (64) is swingably connected.

2. A shedding device (10) according to claim 1, wherein said shedding device frame (22, 24) is disposed in one of the outsides of said heald frames (12) in the cloth width direction and has a side wall (26, 28, 30, 32) extending in said cloth width direction;

wherein said plural rotary drive sources (42) are arranged in plural rows on said side wall (26, 28, 30, 32);

wherein said speed reducer (44) is attached to said side wall (26, 28, 30, 32); and

wherein said reduction shaft (48) penetrates said side wall (26, 28, 30, 32).

3. A shedding device (10) of a loom (16), comprising a plurality of first drive mechanisms (14) provided in one-to-one correspondence to a plurality of heald frames (12), and a plurality of second drive mechanisms (14) provided in one-to-one correspondence to another plurality of heald frames (12);

wherein each of said first drive mechanisms (14) includes: a first rotary drive source (42); a first speed reducer (44) attached to a first shedding device frame (22, 24), said first speed reducer (44) having a first reduction shaft (48) connected to a first output shaft (50) of said first rotary drive source (42) to be driven for deceleration by rotation of said first output shaft (50); a first bearing (38) disposed in said first shedding device frame (22, 24); and a first motion converting mechanism (46) having a first rod (64) and a first rotary member (40), said first rod (64) being connected to said heald frame (12), said first motion converting mechanism (46) converting a rotational motion of said first reduction shaft (48) into a linear reciprocal motion of said first rod (64) through said first rotary member (40);

wherein each of said second drive mechanisms (14) includes: a second rotary drive source (42); a second speed reducer (44) attached to a second shedding device frame (22, 24), said second speed reducer (44) having a second reduction shaft (48) connected to a second output shaft (50) of said second rotary drive source (42) to be driven for deceleration by rotation of said second output shaft (50); a second bearing (38) disposed in said second shedding device frame (22, 24); a second motion converting mechanism (46) having a second rod (64) and a second rotary member (40), said second rod (64) being connected to said heald frame (12), said second motion converting mechanism (46) converting a rotational motion of said second reduction shaft (48) into a linear reciprocal motion of said second rod (64) through said second rotary member (40);

wherein each of said first rotary member (40) has: a first one end portion (54) connected to said first reduction shaft (48); a first other end portion (56) supported by said first bearing (38); and a first intermediate portion (58) which are located between said first one end portion (54) and said first other end portion (56) and to which said first rod (64) is swingably connected;

wherein each of said second rotary member (40) has a second one end portion (54) connected to said second reduction shaft (48); a second other end portion (56) supported by said second bearing (38); and a second intermediate portion (58) which are located between said second one end portion (54) and said second other end portion (56) and to which said second rod (64) is swingably connected;

wherein said first and second shedding device frames (22, 24) are respectively arranged in one and the other outsides of said heald frames (12) in the cloth width direction and have respectively a first and second side walls (26, 28, 30, 32) extending in said cloth width direction;

wherein said first rotary drive sources (42) and said second rotary drive sources (42) are arranged respectively in a plurality of rows on the first and second side wall (26, 28, 30, 32) of the corresponding first and second shedding device frame (22, 24);

wherein each of said first and second speed reducers (44) is attached respectively to the first and second side wall (26, 28, 30, 32) of the corresponding first and second shedding device frame (22, 24); and

wherein each of said first and second reduction shafts (48) penetrates respectively the first and second side wall (26, 28, 30, 32) of the corresponding first and second shedding device frame (22, 24).

4. A shedding device (10) according to claim 3, wherein said plurality of first drive mechanisms (14) are made to correspond to the heald frame (12) on the side near a cloth fell and a plurality of said heald frames (12) adjacent thereto and successive; and

wherein said plurality of second drive mechanisms (14) are made to correspond to the heald frame (12) adjacent to the rearmost end of said successive heald frames (12) and said plural heald frames (12) adjacent thereto and successive.

5. A shedding device (10) according to claim 3, wherein further comprises a plurality of third drive mechanisms (14) provided in one-to-one correspondence to the other plural heald frames (12);

wherein each of said third drive mechanisms (14) includes: a third rotary drive source (42); a third speed reducer (44) attached to said first shedding device frame (22, 24), said third speed reducer (44) having a third reduction shaft (48) connected to a third output shaft (50) of said third rotary drive source (42) to be driven for deceleration by the third output shaft (50); a third bearing (38) disposed in said first shedding device frame (22, 24); and a third motion converting mechanism (46) having a third rod (64) and a third rotary member (40), said third rod (64) being connected to said heald frames (12), said third motion converting mechanism (46) converting a rotational motion of said third reduction shaft (48) into a linear reciprocal motion of said third rod (64) through said third rotary member (40);

wherein said third rotary member (40) has: a third one end portion (54) connected to said third reduction shaft (48); the third other end portion (56) supported on said third bearing (38); and a third intermediate portion (58) located between said third one end portion (54) and said third other end portion (56) and to which said third rod (64) is swingably connected;

wherein said first shedding device frame (22, 24) further has a third side wall (26, 28, 30, 32) opposite to said first side wall (26, 28, 30, 32) and extending in said cloth width direction;

wherein each third rotary drive source (42) is arranged in a plurality of rows in said third side wall (26, 28, 30, 32);

wherein each third speed reducer (44) is attached to said third side wall (26, 28, 30, 32); and

wherein each third reduction shaft (48) penetrates said third side wall (26, 28, 30, 32).

6. A shedding device (10) according to claim 5, wherein said plural first drive mechanisms (14) correspond to the first heald frame (12) on the side near a cloth fell and the plural first heald frames (12) adjacent thereto and successive;

wherein said plural second drive mechanisms (14) correspond to the second heald frame (12) adjacent to the rearmost end of said successive first heald frames (12) and the plural second heald frames (12) adjacent thereto and successive; and

wherein said plural third drive mechanisms (14) correspond to the third heald frame (12) adjacent to the rearmost end of said successive second heald frames (12) and said plural third heald frames (12) adjacent thereto and successive.

7. A shedding device (10) according to any one of claim 5 through 6, wherein said first and third bearings (38) are supported by said first shedding device frame (22, 24) through a common bearing support portion (34, 36).

8. A shedding device (10) of a loom (16), comprising a plurality of first drive mechanisms (14) provided in one-to-one correspondence to a plurality of heald frames (12), and a plurality of second drive mechanisms (14) provided in one-to-one correspond-

ence to a plurality of heald frames (12),

wherein each of said first drive mechanisms (14) includes: a first rotary drive sources (42); a first speed reducer (44) being attached to said shedding device frame (22, 24), said first speed reducer (44) having a first reduction shaft (48) connected to a first output shaft (50) of said first rotary drive source (42) to be driven for deceleration by rotation of said first output shaft (50); a first bearing (38) disposed in said shedding device frame (22, 24); and a first motion converting mechanism (46) having a first rod (64) and a first rotary member (40), said first rod (64) being connected to said heald frame (12), said first motion converting mechanism (46) converting a rotational motion of said first reduction shaft (48) into a linear reciprocal motion of said first rod (64) through said first rotary member (40);

wherein each of said second drive mechanisms (14) include: a second rotary drive source (42); a second speed reducer (44) attached to said shedding device frame (22, 24), said second speed reducer (44) having a second reduction shaft (48) connected to a second output shafts (50) of said second rotary drive source (42) to be driven for deceleration by rotation of said second output shaft (50); a second bearing (38) disposed in said shedding device frame (22, 24); and a second motion converting mechanism (46) having a second rod (64) and a second rotary member (40), said second rod (64) being connected to said heald frame (12), said second motion converting mechanism (46) converting a rotational motion of said second reduction shaft (48) into a linear reciprocal motion of said second rods (64) through said second rotary member (40);

wherein said first rotary member (40) has: a first one end portion (54) connected to said first reduction shaft (48); a first other end portion (56) supported by said first bearing (38); and a first intermediate portion (58) which is located between said first one end portion (54) and said first other end portion (56) and to which said first rod (64) is swingably connected;

wherein said second rotary member (40) has: a second one end portion (54) connected to said second reduction shaft (48); a second other end portion (56) supported by said second bearing (38); and a second intermediate portion (58) which is located between said second one end portion (54) and said second other end portion (56) and to which said second rods (64) is swingably connected;

wherein said shedding device frame (22, 24) has first and second side walls (26, 28, 30, 32) which are disposed in one of the outsides of said heald frames (12) in the cloth width direction and which are opposed to each other at an interval in the back and forth direction and extending in said cloth width direction;

wherein each of said first rotary drive sources (42) and each of said second rotary drive sources (42) are arranged respectively in a plurality of rows on said first and second side walls (26, 28, 30, 32);

wherein each of said first speed reducers (44) and each of said second speed reducers (44) are attached respectively to said first and second side walls (26, 28, 30, 32); and

wherein each of said first reduction shafts (48) and each of said second reduction shafts (48) penetrate respectively said first and second side walls (26, 28, 30, 32).

9. A shedding device (10) according to claim 8, wherein said plural first drive mechanisms (14) corresponds to said first heald frame (12) on the side near a cloth fell and said plural first heald frames (12) adjacent thereto and successive; and

wherein said plural second drive mechanisms (14) corresponds to said second heald frame (12) adjacent to the rearmost end of said successive first heald frames (12) and said plural second heald frames (12) adjacent thereto and successive.

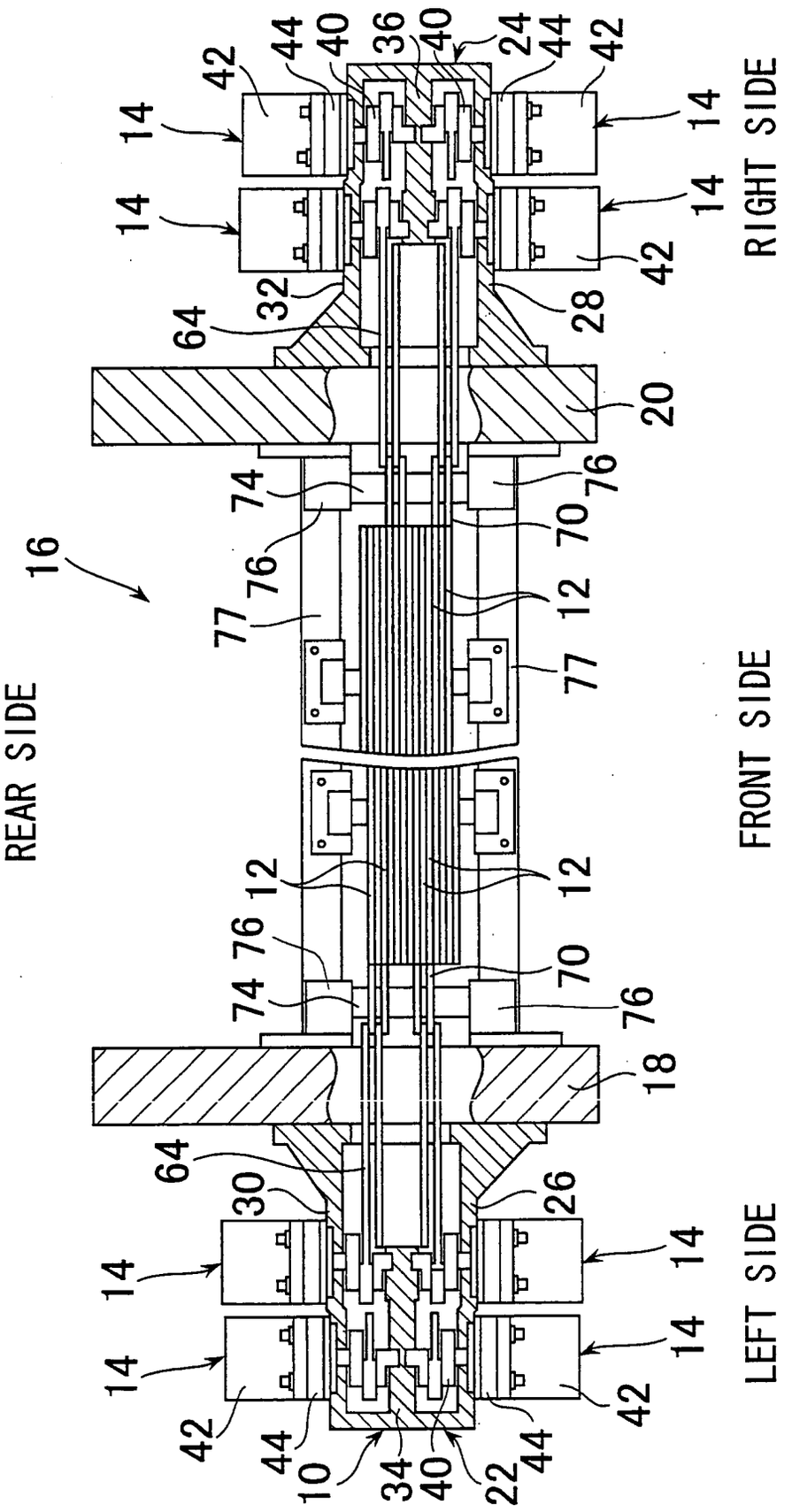
10. A shedding device (10) according to any one of claim 8 through 9, said first and second bearings (38) are supported by said shedding device frame (22, 24) through a common bearing support portion (34, 36).

11. A shedding device (10) according to any one of claims 1 through 10, wherein the axis of each reduction shaft (48) is parallel to the axis of the output shaft (50) of the corresponding rotary drive source (42).

12. A shedding device (10) according to any one of claims 1 through 11, wherein each rotary drive source (42) and the corresponding axis share the axes of said output shaft (50) and said bearing (38), and wherein the axis of each intermediate portion (58) is made eccentric to the corresponding common axis.

13. A shedding device (10) according to any one of claims 1 through 12, wherein each rotary member (40) has a substantially circular shape as viewed in the direction of its rotation axis and is adapted to be an eccentric cam to which said intermediate portion (58) is connected eccentrically.

FIG. 1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FRONT SIDE
RIGHT SIDE
LEFT SIDE
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14
42
44
40
36
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30
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22
34
10
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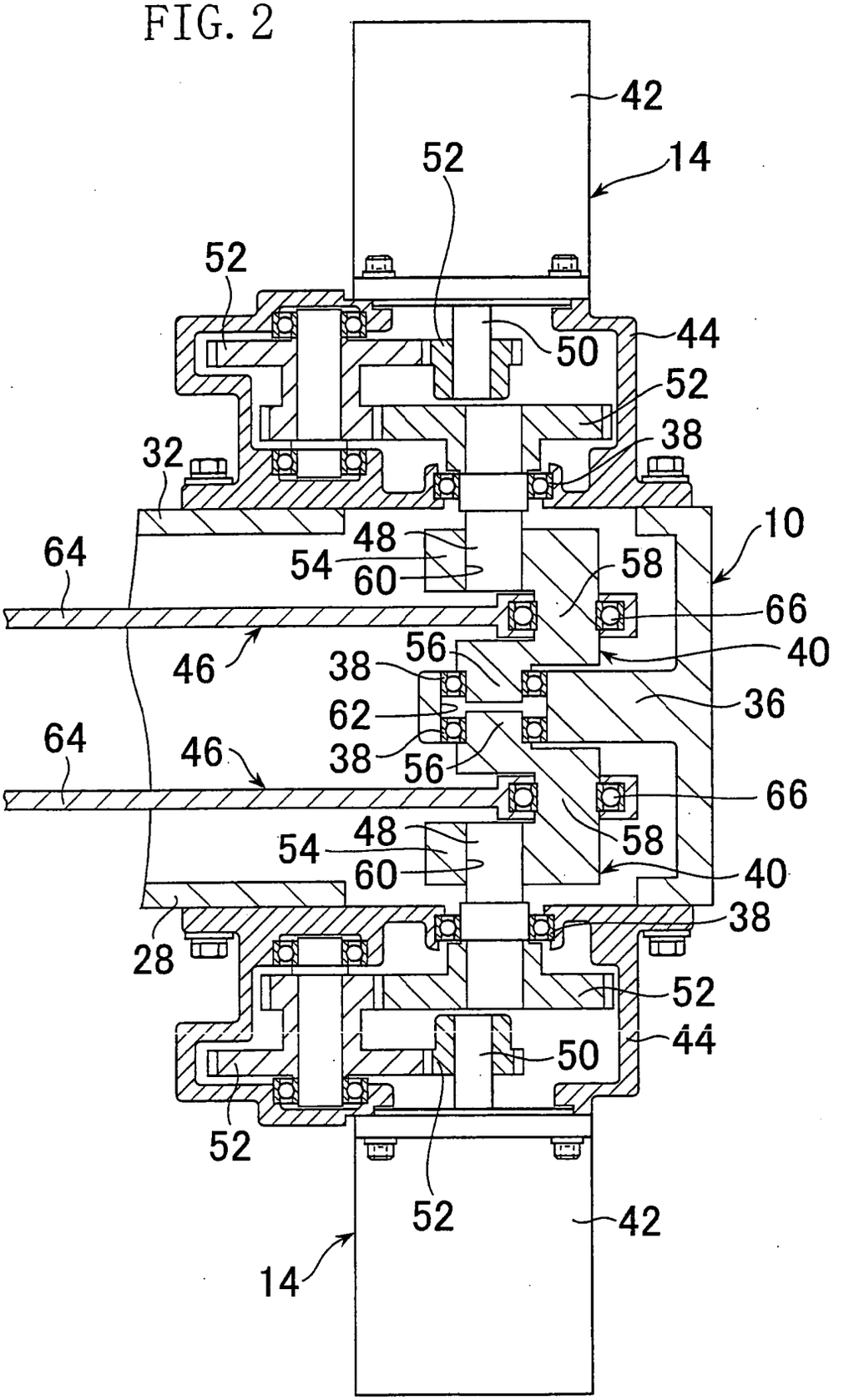
70
12

FIG. 2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42
14

FIG. 3

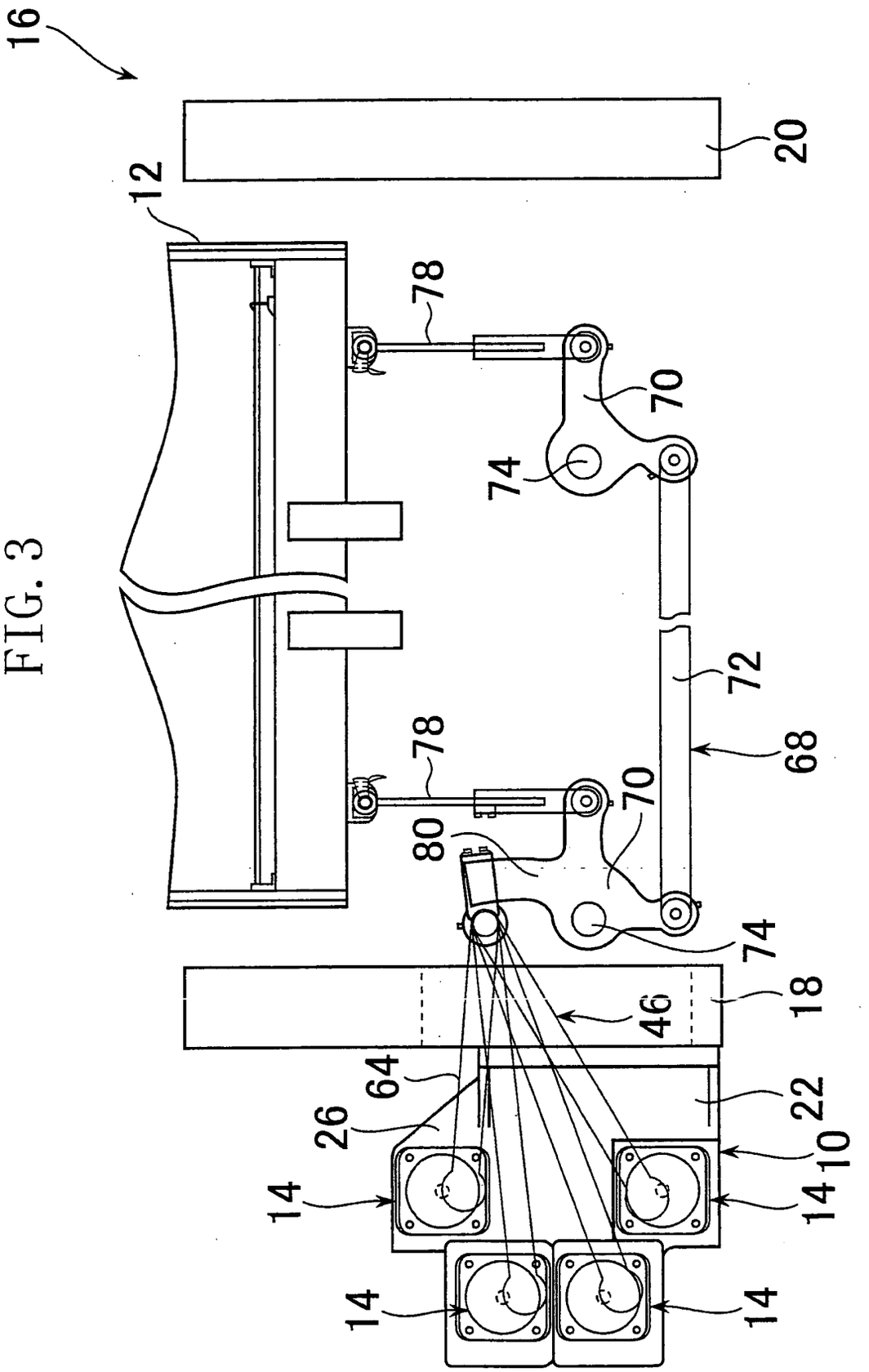


FIG. 4

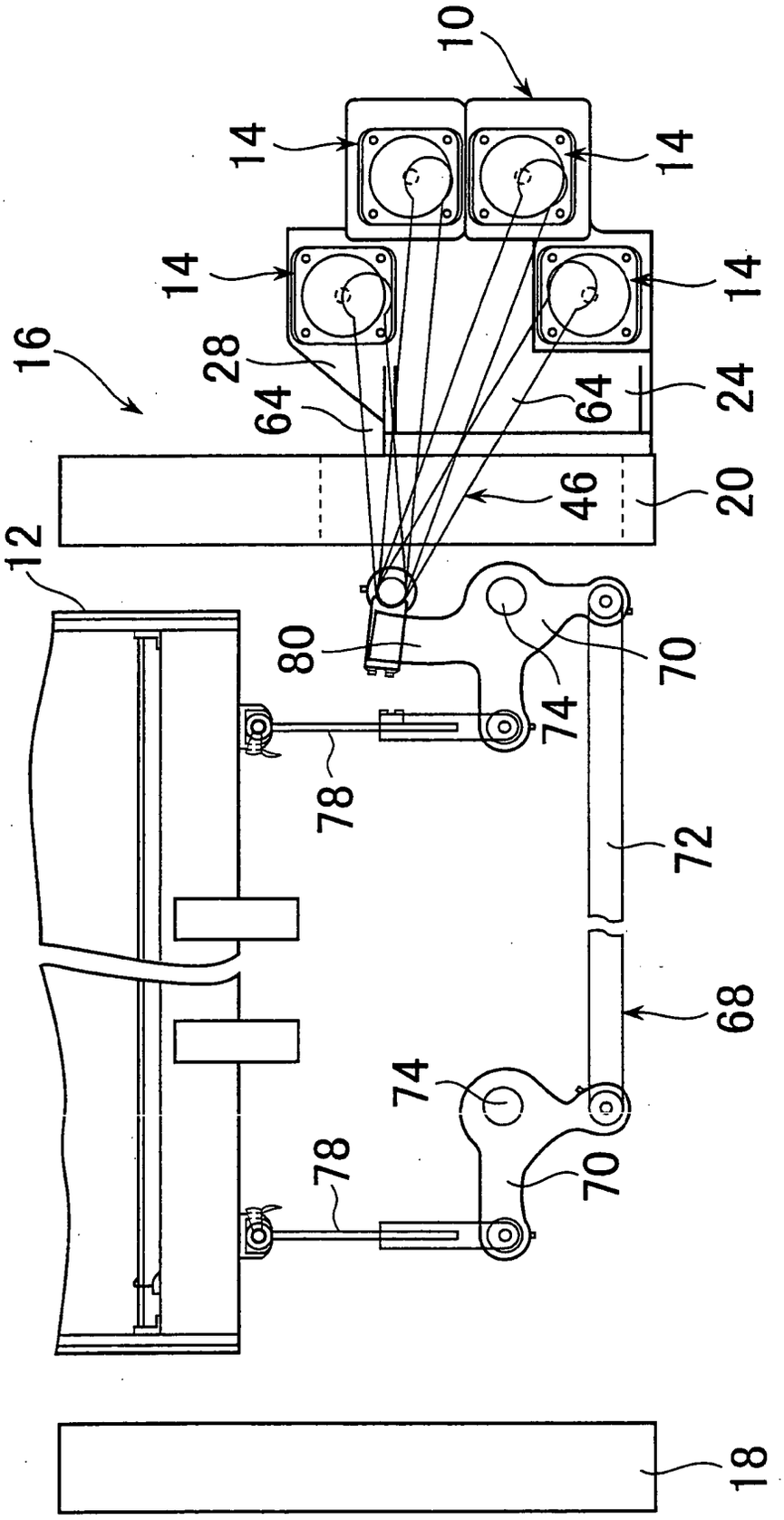


FIG. 5

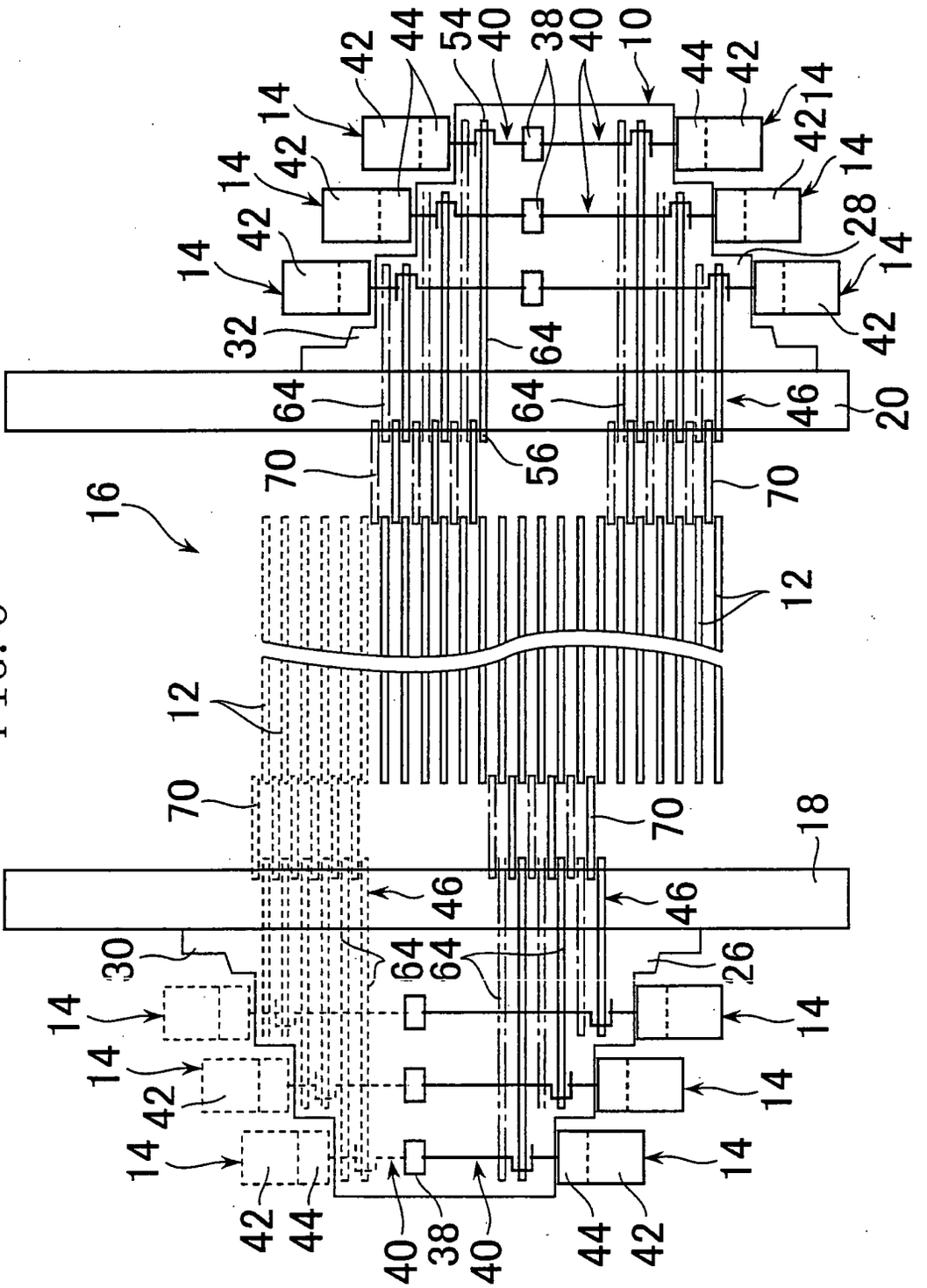
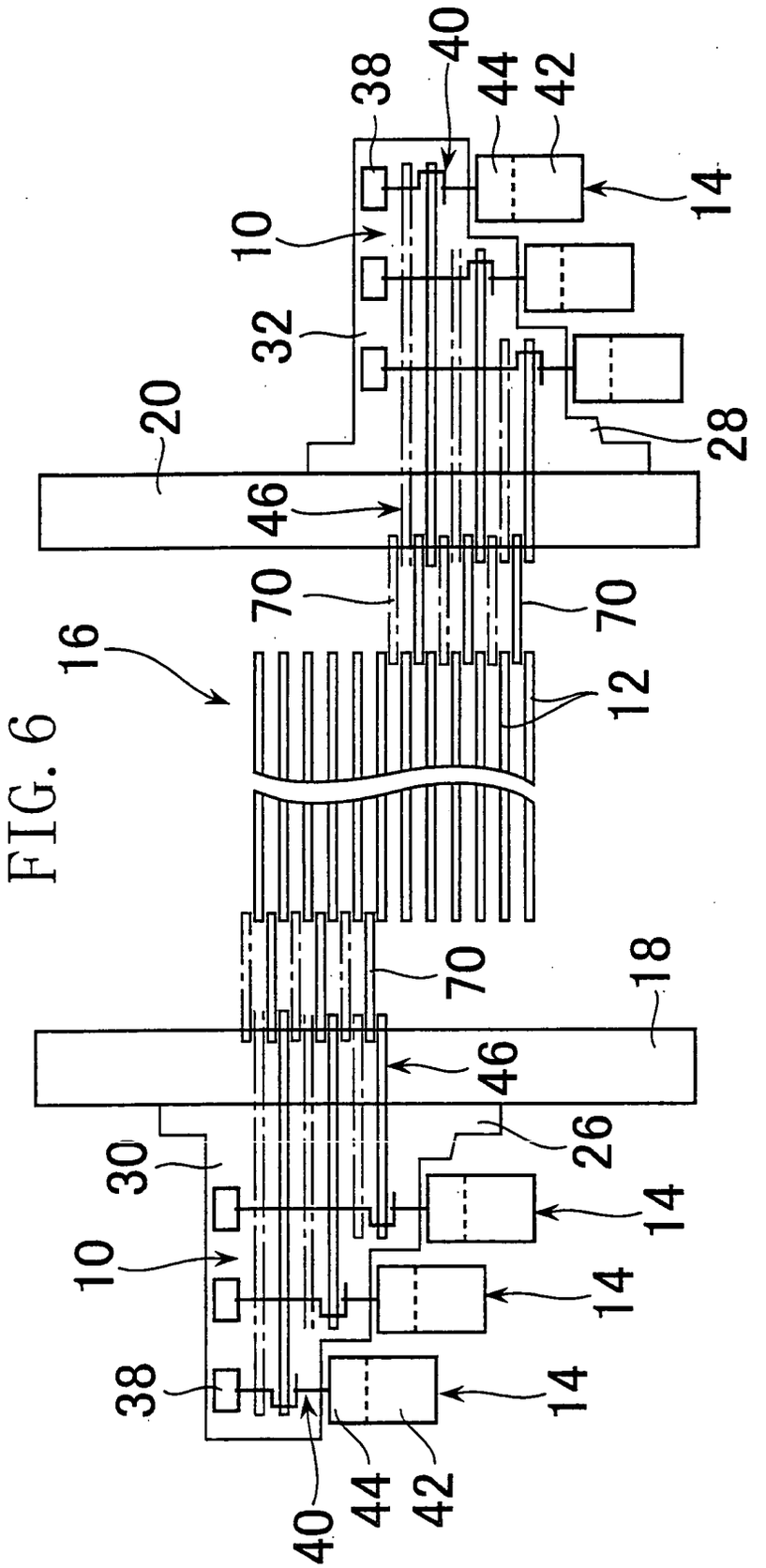


FIG. 6


40
38
44
42
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10
32
20
28
46
70
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16
12
70
18
46
26
30
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14
38
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44
42

FIG. 7

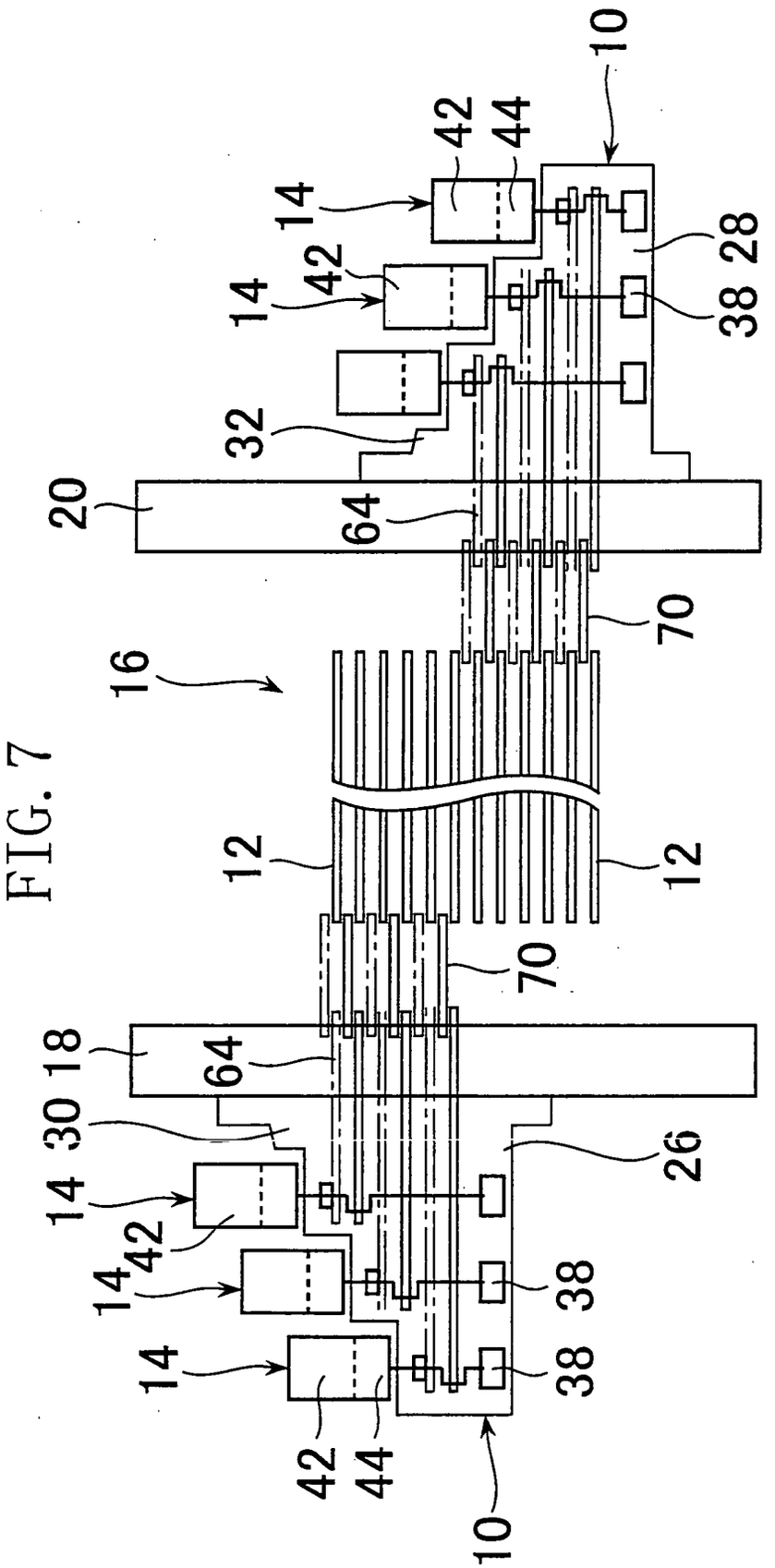

FIG. 8 (A)

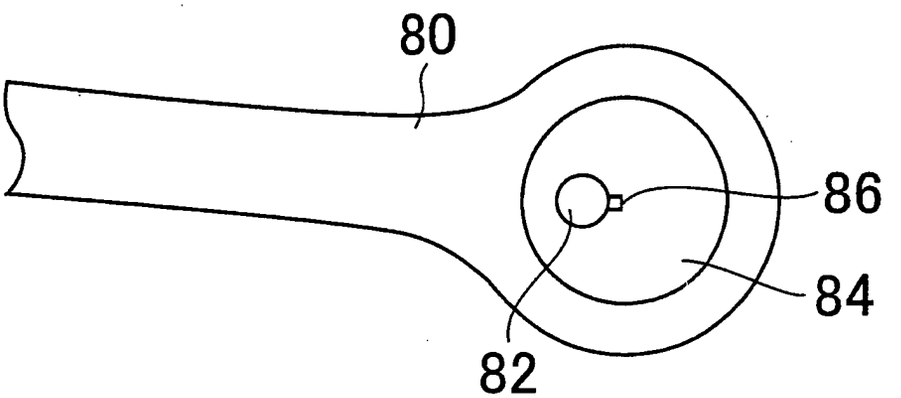

FIG. 8 (B)

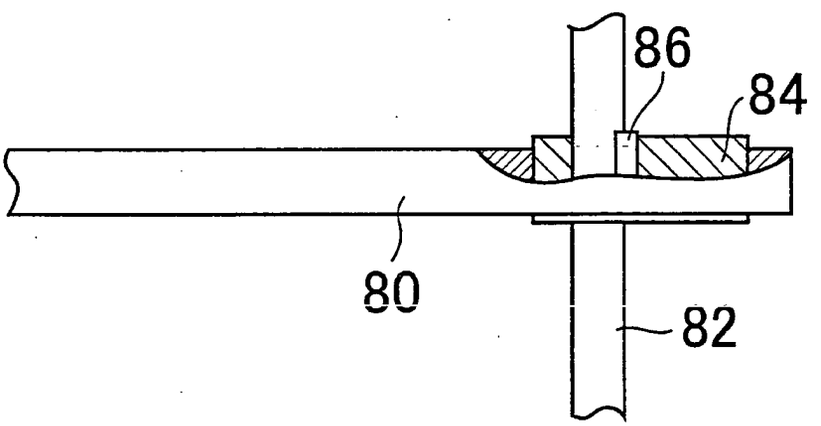

FIG. 9

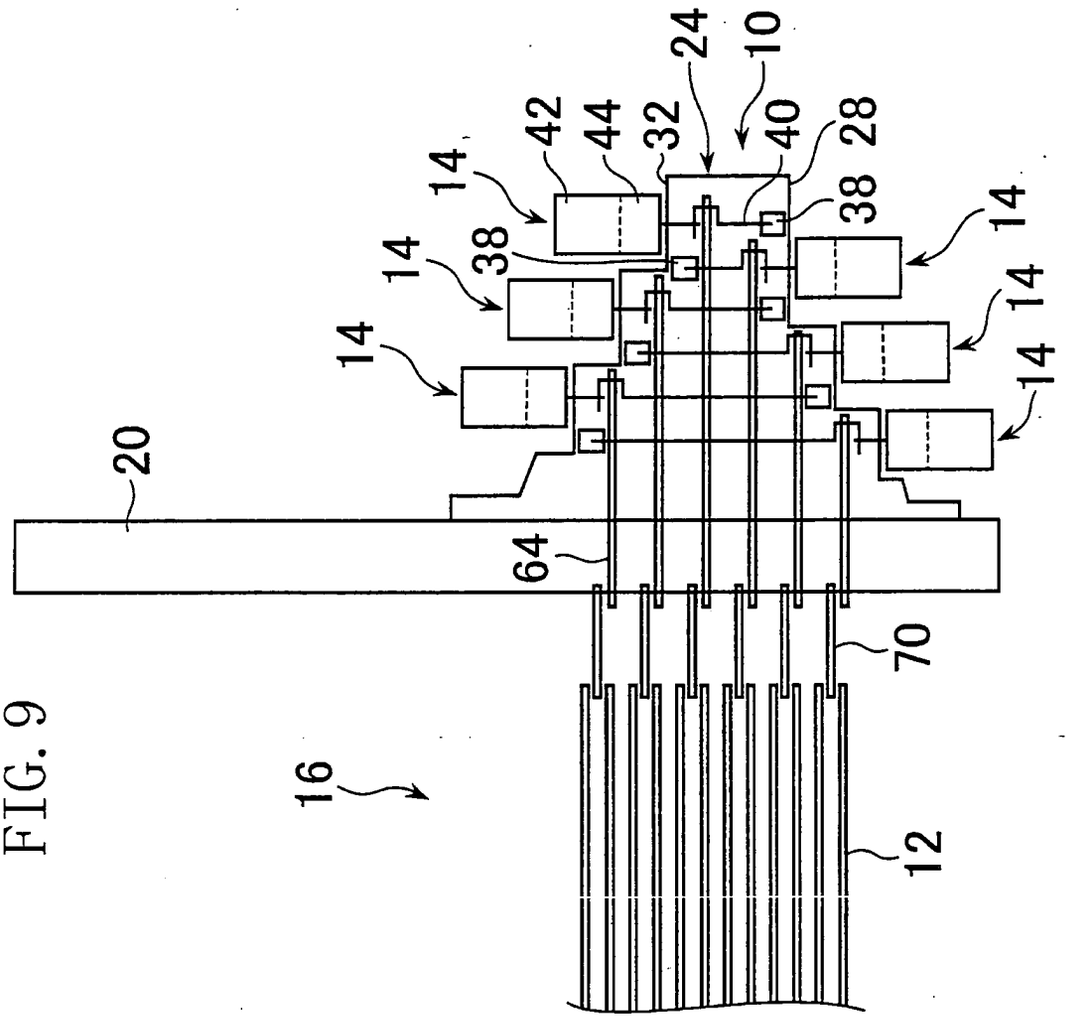

FIG. 10