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(54) Amusement device.

(57) An amusement device enables two players to play a game resembling conventional arm wrestling. One player sits on a seat (8) each side of the device. Each player has a handle (16) to grasp, the handle being mounted on an associated operating arm (15) connected to a common main shaft (24) which is rotatable about a horizontal axis. Biasing means (19, 20) is provided to compensate for differences in the players' strengths or physiques. The biasing means may comprise a reversible motor (19) which drives, through reduction gearing, the input of a slipping clutch (20). The output of the clutch is connected to the main shaft. The strength of the coupling effected by the clutch can be varied. Sensing switches (30, 35) are operated by each player when he or she is in a suitable playing position. Movement from that position generates warning signals. In a modification the device may be used by a single player. In that case the biasing means counters unaided the forces exerted by the player. The second handle and arm may be omitted if the device is always to be used by only a lone player.

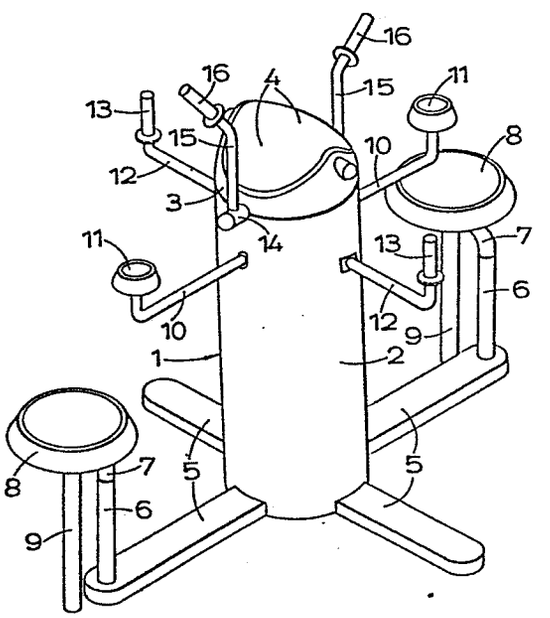

FIG. 1.

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AMUSEMENT DEVICE

This invention relates to an amusement device, and more particularly to a device for use in playing a game similar to the game known as arm wrestling.

Conventional arm wrestling is a form of contest in which two players match their strength. In playing a game the two players sit facing one another from opposite sides of a table, place the elbows of their playing arms close together on the table with their forearms upright and clasp together the hands of their playing arms. At a given starting signal each exerts a force with his or her playing arm such as to try to move the other player's forearm from an upright position to a substantially horizontal position, in which one of the clasped hands touches the top of the table.

In any one game the players use either their right arms alone or their left arms alone, as may be agreed between them. In this description the arms that the players use are referred to as their playing arms, while the players' other arms are referred to as their idle arms.

One drawback of conventional arm wrestling is that satisfactory games can be held only between players of similar strength or physique, for otherwise the stronger player tends rapidly and regularly to vanquish the weaker player. Another drawback is that someone who wishes to play arm wrestling must find a contestant to play with.

An aim of the present invention is to provide an amusement device which can enable these and other drawbacks of the conventional game to be overcome, or at least reduced.

According to the present invention there is provided an amusement device comprising a reaction member for engagement by a player's hand, said reaction member being movable in a path resembling that which would be followed by the hand of a player taking part in a conventional game of arm wrestling with the aforementioned or first player, and biasing means capable of applying to said reaction member a force appropriate to enable said first player to take part, with the aid of the device, in a game resembling conventional arm wrestling.

In one preferred form of amusement device there is also provided a second reaction member additional to the aforementioned or first reaction member and movable in a path resembling that which would be followed by the hand of a second player taking part in a game of arm wrestling, coupling means such that in use movement of each coupling member is mirrored by complementary movement of the other reaction member, the biasing means being capable of adjustment in such a manner that in use when either player exerts a force on his or her associated reaction member a resultant force of a different strength is exerted on the other's hand by the other reaction member, so that players of unequal strength or different physiques can compete on substantially equal terms with each other.

The coupling means may be such as to provide a direct connection between the first and second reaction members, in which case the biasing means is capable of applying biasing forces to the coupled reaction members, at least when the reaction members are in certain positions, so as to compensate for differences in the strengths or physiques of the first and second players. Alternatively the coupling means may be combined with at least part of the biasing means and be operative to

provide one reaction member with a mechanical advantage over the other reaction member. In either case the biasing means is preferably adjustable in such a manner that when one player exerts a certain force on his or her associated reaction member the strength of the resultant force exerted by the other reaction member depends on the adjustment of the biasing means. The biasing means is preferably such that it can be adjusted to a zero setting such that when one player exerts a certain force on his or her associated reaction member the same resultant force is exerted by the other reaction member. This enables the device to be adjusted to an additional state in which it is suitable for use by players of equal strength or similar physique.

An amusement device of the preferred form outlined above is capable of use by first and second players, who contest with each other. This constitutes use of the device in a two-player mode. Such a device, however, may also be such as to be capable of use by one player alone, without an opponent, that is in a one-player mode, in which case the biasing means is operative in use to counter unaided the forces exerted by said one player's hand. When the device is used in the one-player mode it would usually be necessary to enable the biasing means to apply relatively large forces to the reaction member used by the first player, for the biasing means alone has to counter unaided the forces exerted by the first player; this is in contrast to the use of the device in the two-player mode, when the forces exerted by each player are at least partially countered by forces exerted by the other player, the biasing means then merely serving to assist the weaker player. The biasing means may comprise a single mechanism capable of use in both the modes of use but this is not essential and the biasing means may comprise one mechanism for use in the one-player mode and

a separate and distinct mechanism for use in the two-player mode.

In a second preferred form of amusement device there is only one reaction member, and the biasing means is operative in use to counter unaided the forces exerted by the player's hand. A device of this form is of course capable of use only in a one-player mode.

The biasing means is preferably adjustable to enable the device to be used on different occasions by players of different strengths or physiques; the adjustment can then be made such that in any contest between a player and the device, and in which the player plays fairly, it is not a foregone conclusion which will be the victor.

Any device in accordance with the present invention may include fluctuation means operative in use to vary the resistance encountered by the first player's hand, or by both players' hands, while a game is in progress, in a manner not foreseen by the first player or by the players, as the case may be. In the absence of such fluctuation means a game can be somewhat dull or 'dead', particularly a game played in the one-player mode. With the use of such fluctuation means, however, a game can normally be considerably enlivened. When the device is being used in the two-player mode and fluctuation means is in operation it is generally impossible for either player to assess whether variations in resistance experienced by him or her are generated by the fluctuation means or by the other player.

In any form of device in which adjustment is possible there is preferably provided setting means which can be set to effect an appropriate adjustment of the biasing means before a game starts, the setting means

preferably incorporating indicating means which is operative to provide information as to which setting of the setting means is appropriate for the player of the game (if the device is to be used in the one-player mode) or for both players of the game (if the device is to be used in the two-player mode). For example the indicating means may provide information as to which settings of the setting means are appropriate for any one or more of the following attributes of the player or of each player: sex, body-weight and age.

The device may additionally or alternatively include signalling means operative to provide a signal indicating when a particular stage of a game is reached, and preferably operative to provide other signals indicating when other stages of a game are reached as well. For example the signalling means may be operative to provide a signal or signals at any one or more of the following stages of a game: when a player is to expect a game to start, when a player or the device is near victory and when a player or the device achieves victory. In addition or alternatively the signalling means may be operative to indicate the number of games, in a series or set of games, that have been won by the player and by the device (in the one-player mode) or by each of the players (in the two-player mode).

One of the problems that may arise in conventional arm wrestling is that a player can often obtain an unfair advantage if he or she moves from an agreed playing position in the course of a game. There is thus a need to ensure that the player or each player remains in an agreed playing position throughout a game. In particular it is normally agreed that during any game the player or each player should not rise from his or her seat, should not remove from the table the elbow of his or her playing

arm, and should not use his or her idle hand to interfere with the progress of the game. To overcome or reduce such problems it is preferred to provide sensing means which can be operated by a player when the player is in a suitable playing position but which is operative to activate signalling means and thus give rise to a warning signal if and when the player moves from that agreed position. The sensing means may be responsive to a player moving in any one or more of the following ways: rising from his or her seat, raising the elbow of his or her playing arm from a predetermined position, and moving his or her idle arm from a predetermined position.

The biasing means preferably comprises a motor and a slipping clutch connected to the motor so as to transmit torque from the motor. The reaction member or each reaction member is preferably constrained to follow a part-circular path. Moreover the reaction member or each reaction member preferably comprises a handle on an arm mounted for rotation about an axis transverse to the arm.

One particular form of amusement device embodying the present invention will now be described in more detail, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is an isometric view of an amusement device embodying the present invention,

Figure 2 is a side view of a device very similar to that shown in Figure 1, with a casing thereof broken away to reveal the interior and with some parts shown in section,

Figure 3 is a section substantially along the line 3-3 of Figure 2,

Figure 4 is a plan view corresponding to Figure 3 but with the top of the casing removed and with certain parts broken away to reveal other parts beneath, and

Figure 5 illustrates the layout of signalling means and of setting means incorporating indicating means on a display panel constituting part of the device.

Each of the devices illustrated is capable of use both in a two-player mode and in a single-player mode. As the devices are so similar the same reference numerals are applied to corresponding parts.

The device illustrated in Figure 1 comprises a casing 1 of which a lower part 2 is in the form of a rigid metal cylinder with its axis vertical. For clarity of illustration stiffening within the lower part of the casing is not illustrated. An upper part 3 of the casing is shaped as shown to present inclined display faces 4 of approximately semi-circular shape. Four feet 5 project radially from the lower end of the casing and serve to stabilise the device in use. Pivot rods 6 project upwards from the outer ends of two of the feet 5 and have upwardly and outwardly extending curved brackets 7 pivoted to their upper ends. Each bracket 7 carries a seat 8 which is also supported by a ground-engaging support tube 9 extending vertically downwards from its centre. With this arrangement each seat 8 is movable in an arc around the axis of the associated pivot rod 6, whereby its position relative to the casing 1 can be varied. Projecting from the casing 1 towards the seats 8 are arms 10 carrying at their outer ends adjustable elbow-rests 11. Approximately at right angles to the arms 10, a pair of arms 12 project from the casing 1 and carry at their outer ends hand-grips 13 for the players'

idle hands. Parallel with the arms 10 but at a higher level there is a main shaft which carries tubular extensions 14 which project from the casing. Operating arms 15 extend upwards from the projecting parts of the extensions 14, each operating arm carrying at its upper end an outwardly inclined handle 16 constituting a reaction member.

Referring now to Figures 2 to 4, these show operating mechanism contained within the casing 1. Mounted in the casing is a horizontal supporting frame 17 comprising square-section tubes disposed in the shape of a cross, the ends of the tubes being firmly connected to the casing. A bracket 18 is suspended from the frame and carries a reversible electric motor 19 at its lower end. An output shaft of the motor rotates about a vertical axis and is connected to reduction gearing having a horizontal output shaft connected to the input of a slipping clutch 20. The slipping clutch 20 has an output co-axial with the input and connected to a pulley 21. The arrangement is such that the degree or extent of the coupling between the input and the output of the clutch can be varied. The clutch may be of any suitable construction and may for example comprise a fluid coupling. Preferably, however, the clutch 20 is a magnetic clutch of a well-known kind. This comprises a fixed, annular outer casing containing a stator comprising electromagnets which in use are fed with a d.c. current and produce an axial field. Inside the stator and co-axial with it is a rotatable core incorporating a permanent magnet and connected directly to the output shaft of the reduction gearing driven by the motor 19. Also inside the stator and co-axial with it and the core is a rotatable ferromagnetic disc coupled to the pulley 21. The disc is normally biased axially away from the core by spring means. When a suitable

current is passed through the stator, however, a magnetic circuit is formed through the core and the disc with the result that the disc is attracted to the core and engages it frictionally. As the current increases the frictional engagement also increases. Thus, when the motor is running at a constant speed, as is normally the case, and the pulley 21 is held against rotation, a torque is applied to the pulley, through the frictional engagement between the core and the disc, which is dependant on the current passing through the stator. This torque gives rise to the biasing forces on the handle 16.

An endless belt 22 passes round the pulley wheel 21 and also round a pulley wheel 23 which is of larger diameter than the pulley wheel 21 and is keyed to the main shaft referred to above, the main shaft having the reference numeral 24. The main shaft 24 runs in mutually spaced bearings 25 secured to the upper ends of square-section tubular pillars 26 of which the lower ends are mounted on the frame 17.

Inner end portions of the arms 10 extend through apertures in the lower part 2 of the casing and through guides 27 mounted on the frame 17. Each arm 10 carries a pin 28 at its inner end which prevents the arm being pulled out of its associated guide. Nevertheless each arm 10 is free to be pushed axially inwards to a limited extent through its guide. Moreover each arm 10 is also capable of limited tilting movement in a vertical plane. To this end it is mounted loosely in its associated guide. Near the outer end of each guide, and beneath the associated arm 10, is a strong leaf spring 29 which urges the arm upwards, away from a micro-switch 30 secured below the guide. When downward pressure is applied to either one of the elbow-rests 11, the associated

spring 29 yields and the associated micro-switch 30 is operated.

The elbow-rest 11 illustrated in Figure 2 is mounted on its associated arm in such a manner that its position can be adjusted by screwing it up or down. To this end the elbow-rest is secured to the upper end of an axially extending screw of which a lower portion engages a nut secured in a sleeve 31 at the outer end of the arm 10. In a modified arrangement shown in Figure 1 the sleeve 31 is replaced by an upwardly bent end portion of the arm 10.

Inner end portions of the arms 12 also extend through apertures in the lower part 2 of the casing. They enter associated housings 32. A vertical pivot pin 33 extends vertically through each housing 32 and that part of the associated arm within it. Each of the arms 12 is thus able to swing horizontally through an arc limited by the engagement of the arm with vertical stop pins 34 adjacent to the pivot pin 33.

Each of the hand-grips 13 and each of the handles 16 is provided with an electric switch 35 operable by a push-button at the end thereof. Each switch is spring-biased to an off position but is such that when a player's hand grips the hand-grip or handle concerned the button can be depressed by the thumb to bring the associated switch to an on position. The micro-switches 30 and the switches 35 together constitute sensing means. Further each seat 8 incorporates an electric switch (not shown) so arranged that when no one is seated on the seat the associated switch is off but when someone is seated on the seat that switch is on. Such seat switches also constitute part of the sensing means.

Tracking means (not shown) is coupled to the main shaft 24 and is operative to provide an electric signal or signals varying with changes in the position of the main shaft 24. For example the tracking means may comprise a variable resistor with a rotary drive coupled to rotate with the main shaft. Preferably, however, the tracking means comprises an actuating pin projecting radially from the main shaft 24 and three micro-switches mounted at fixed positions around the shaft. Each micro-switch has an actuating element in the path of the actuating pin. The arrangement is such that when the operating arms 15 are vertical the actuating pin depresses the actuating element of one micro-switch, when the arms extend horizontally to one side of the device the pin depresses the actuating element of a second one of the micro-switches, and when the arms extend horizontally to the other side of the device the pin depresses the actuating element of the third of the micro-switches.

Each of the display faces 4 of the casing is provided with a panel carrying setting means, indicating means and signalling means as shown in Figure 5. The setting means comprises the following touch-switches: 37, to be operated if a game is to be played by a single player; 38, to be operated if a game is to be played by two players; 39, to be operated if the player is male; 40, to be operated if the player is female; 41, to be operated if the weight displayed by a numerical display (described below) is to be increased; and 42, to be operated if that weight displayed is to be decreased. The setting means also incorporates indicating means comprises the wording in association with the touch-switches 37 to 42 together with the numerical display. When any of the switches is operated it is illuminated from behind, that illumination constituting

part of the indicating means. The signalling means comprises the following panels which are illuminated in the following circumstances: 43, when the operating arms 15 are vertical and a game is to be begun; 44, when a game is in progress; 45, when a player wins; 46, when a player loses; 47, when the associated seat switch is off; 48, when the associated micro-switch 29 is off (the player's elbow being raised); 49, when the player's idle hand fails to operate the switch 34 in the associated hand-grip 13; and 50, when the player's playing hand fails to operate the switch 34 in the associated handle 16. As indicated above, the indicating means also includes a numerical display 51 (referred to above) which initially indicates a low weight. The numerical display may comprise a liquid-crystal display. When touch-switch 41 is operated, however the weight indicated by the display 51 progressively increases until the touch-switch 41 is released. Similarly if the touch-switch 42 is operated the weight indicated progressively decreases. The information on each panel applies to the player using the seat 8 facing that panel.

The device also includes a micro-processor and associated ROMs operative to control the clutch 20 and the signalling means in response to signals from the sensing means, the tracking means and the setting means.

When the device is to be used by two players, each of the players occupies one of the seats 8. Before sitting down, the players decide whether they are to play a right-handed or a left-handed game, and they move the seats to appropriate positions and adjust the heights of the seats. They then sit down. One of the players then operates a switch (not shown) to a 'Right' or 'Left' setting which corresponds to the hand of the game decided on. The players also operate the touch-switches 38 and

the appropriate ones of the touch-switches 39 and 40. They also operate the touch-switches 41 (and if necessary the touch-switches 42) in such a manner that each player's own body-weight is indicated by the associated numerical display 51. The display may indicate the body-weight in any suitable units, for example in stones and pounds or in kilograms. There may be upper and lower limits to the weights displayed. For example the weights may run from 7 stone to 14 stone (i.e. 98 lbs to 196 lbs or 44.5 kg to 89 kg respectively), any player with a body-weight outside those limits employing the nearer limiting value.

Each player then places the elbow of his or her playing arm on the adjacent elbow-rest 11, (having, if necessary, adjusted its vertical position so that it is suitable for his or her particular length of forearm) grips the adjacent handle 16 with his or her playing hand and depresses the associated push-button of the associated switch 34 with his or her thumb. At the same time each player grips the adjacent hand-grip 13 with his or her idle hand and depresses the associated push-button of the associated switch 35 with the thumb of that hand. Thus all the switches of the sensing means are operated.

The microprocessor then operates the signalling means so as to warn the players that the game is about to start, but the game will not start until the operative arms 7 are vertical. The game then starts. Signals from the setting means have already led the microprocessor to determine what average biasing torque should be applied to the main shaft 24 in order to give each player a fair chance of victory. It may be that no biasing torque is necessary, in which case no such torque is applied to the main shaft 24; it is much more likely, however, that the application of a biasing torque will be appropriate.

This torque is applied by the motor 19 operating through the clutch 20, the pulleys 21 and 23, and the belt 22. The arrangement is preferably such that the clutch operates gradually to increase any biasing torque to the average value required, for in this way no sudden forces are imposed on the players' hands and arms.

The rotational direction in which the torque is applied is reversed when the rotational direction of the motor is reversed. Throughout a game, the rotational direction of the motor and the strength of the current applied to the clutch (and thus the force applied at any moment to the handle 16 and the direction of that force) is determined by the microprocessor.

The device also includes fluctuation means such that in addition to its normally applying a biasing torque, the clutch 20 also operates to apply fluctuations or variations in torque to the main shaft 24 in a random manner or at least in a manner that is sufficiently varied as not be foreseeable by the players. The effect of these fluctuations or variations in torque is such that it is generally impossible for either player to tell whether the variations in the reaction forces exerted on his or her playing hand are derived from the other player or from the device itself. The fluctuation is effected by varying the electric current applied to the clutch 20. A pattern of suitable current variation may be generated by the microprocessor and it may be random or pre-recorded and stored in a ROM.

In the course of the game the rotational or angular position of the main shaft 24 is likely to vary in favour of one player or the other. The tracking means may be such that variation in position alters the setting and the electrical properties of the tracking means. This

information is fed to the microprocessor. The programme of the microprocessor may be such as to take this information into account so as to enable the biasing torque to be varied in such a manner as to provide an enjoyable game. For example, if it becomes apparent that one player is likely to win rapidly an increased biasing torque may be applied, at least for a while, to counter or to counter more strongly the force applied by that player. In the arrangement described above, however, where the tracking means comprises only three micro-switches the only information that can be supplied to the microprocessor is whether the arms are vertical (or substantially vertical) or are horizontal. Variation of the biasing torque in a manner dependant on the inclination of the arms is therefore not possible.

Victory for one player or the other occurs when the operating arms 15 have reached a substantially horizontal position, this being detected by the tracking means. When a victorious position is reached this is signalled by the illumination of the panel 45. On the loser's side the panel 46 is illuminated. The game is then brought to an end.

If, during the course, of a game, either player should move in such a manner that any of the four switches (the seat switch, micro-switches 30 and switches 35) under his or her control is released, the game is brought to an end and the appropriate panel (47, 48, 49 or 50) is illuminated. The device may operate in such a manner that during a subsequent game a player who incurs a warning in this manner is penalised.

The use of the device in a two-player mode has been described above. If the device is to be used in a one-player mode the player sets the setting means largely

as before but operates the touch-switch 37 instead of the touch-switch 38. This causes the microprocessor to apply to the main shaft 24 during the course of the game an average biasing torque appropriate to the sex and weight of the player. Fluctuations or variations in torque are also applied as in the two-player mode of use described above.

In either mode of use the microprocessor operates to prevent any very rapid or sudden movement of the operating arms 15 such as might cause injury.

Any of various modifications and additions may be made to the device. For example the device may be made such as to require the insertion of a coin or coins before it can be used. In addition to the visible signals the device may incorporate means providing audible signals. These may, for example, supplement the visible warning signals that occur when the sensing means detects movement of a player from the correct playing position. Alternatively or in addition the audible signals may indicate when a player is nearing victory or has won a game.

The device may have the facility to enable it, in the one-player mode, to apply to the main shaft 24 a pattern of fluctuations or variations in torque which is the same as that applied by a successful or famous arm-westler in a game in which he or she was the victor. The pattern may be capable of being modified in response to variations in the settings of the touch-switches 39, 40, 41 and 42 so as to give any player a reasonable game when employing that facility.

Another form of device in accordance with the present invention is largely similar to that described

above but is arranged to be used only in the one-player mode. It therefore lacks one of the operating arms 15, and also lacks the seat 8, arm 10, elbow rest 11, arm 12 and hand-grip 13 associated with that missing operating arm and it has only one display panel. In order to avoid games played on such a device being dull, fluctuation means of the kind described is preferably included.

In each of the devices described above there is a microprocessor controlling the operation of the device. In less complex devices the microprocessor may be omitted, at least part of its function being carried out by suitable logic circuitry which may comprise solid-state electronic components.

The device preferably includes locking means operative to lock the reaction member or reaction members against movement when a game is not being played. The locking means is also preferably operative when the power supply to the device is disconnected. The locking means may comprise an electromagnetic clamp which is held inoperative by an electric current when a game is being played but which is at all other times allowed to operate under spring-loading so as to secure the main shaft against rotation. It may for example lock the main shaft if and when the main shaft is rotated so that the operating arms are vertical or horizontal.

If desired a device embodying the invention may also incorporate a printer or be capable of attachment to a printer enabling information about the use of the device to be printed out. For example there may be a keyboard enabling a player to enter his or her name and a printer operative to issue a printed slip after a game has been concluded providing details of the game, including the player's name. Those details may include the player's

weight, the time and date when the game took place, the outcome of the game and the duration of the game. Where a microprocessor is included in the device, information for the slip may well be derived from it.

Each of the devices described is entirely powered and controlled by electrical means. This is not essential, and in modified arrangements some of the functions may be carried out by mechanical, hydraulic, pneumatic or other means. For example, the logic circuitry used in place of the microprocessor may be of pneumatic or hydraulic form and some or all of the associated switches may be replaced by equivalent pneumatic or hydraulic components. The tracking means may for example be replaced by pneumatic bellows so arranged that the pneumatic pressure varies in accordance with the rotational position of the main shaft 24. Alternatively the tracking means may be replaced by a piston-and-cylinder unit acting in a manner similar to the bellows. Likewise the electric motor 19 may be replaced by a pneumatic or hydraulic motor; alternatively, torque may be applied to the main shaft 24 (or some equivalent part) by means of a piston-and-cylinder unit. Where the device uses compressed air, this may be derived from a replaceable air-bottle or from a power-driven compressor. The compressor may be incorporated in the device or it may be situated elsewhere. In the latter case the air would be supplied to the device through suitable pipework. Similarly if the device uses hydraulic fluid, this may be supplied under pressure from an external source, though it is envisaged that it would be usual to incorporate a power-driven hydraulic pump in the device.

CLAIMS

1. An amusement device characterised in that it comprises a reaction member (16) for engagement by a player's hand, said reaction member being movable in a path resembling that which would be followed by the hand of a second player taking part in a conventional game of arm wrestling with the aforementioned or first player, and biasing means (19, 20) capable of applying to said reaction member a force appropriate to enable said first player to take part, with the aid of the device, in a game resembling conventional arm wrestling.

2. An amusement device according to claim 1 characterised in that there is a second reaction member (16) additional to the aforementioned or first reaction member and movable in a path resembling that which would be followed by the hand of a second player taking part in a game of arm wrestling, coupling means (24) such that in use movement of each coupling member is mirrored by complementary movement of the other reaction member, the biasing means being capable of adjustment in such a manner that in use when either player exerts a force on his or her associated reaction member a resultant force of a different strength is exerted on the other's hand by the other reaction member, so that players of unequal strength or different physiques can compete on substantially equal terms with each other.

3. An amusement device according to claim 2 characterised in that the coupling means (24) is such as to provide a direct connection between said first and second reaction members.

4. An amusement device according to either of claims 2 and 3 characterised in that the biasing means is also

capable of adjustment to a zero setting such that when one player exerts a certain force on his or her associated reaction member the same resultant force is exerted by the other reaction member.

5. An amusement device according to claim 2 characterised in that it is capable of use not only by first and second players in a two-player mode but also by one player alone in a one-player mode, the biasing means being operative in the one-player mode to counter unaided the forces exerted by said one player's hand.

6. An amusement device according to claim 1 characterised in that there is only a single reaction member, and the biasing means is operative in use to counter unaided the forces exerted by the player's hand.

7. An amusement device according to claim 6 characterised in that the biasing means is adjustable to enable the device to be used on different occasions by players of different strengths or physiques.

8. An amusement device according to any one of the preceding claims characterised in that there is fluctuation means operative in use to vary the resistance encountered by the first player's hand if there is only one player, or by both players' hands if there are two players, while a game is in progress, in a manner not foreseen by the player or players.

9. An amusement device according to any one of the preceding claims characterised in that there is setting means (37 to 42) which can be set to effect an appropriate adjustment of the biasing means before a game starts.

10. An amusement device according to claim 9 characterised in that the setting means includes indicating means (51) which is operative to provide information as to which setting of the setting means is appropriate for the player or players of the game.

11. An amusement device according to any one of the preceding claims characterised in that it includes signalling means (43 to 46) operative to provide a signal indicating when a particular stage of a game is reached.

12. An amusement device according to any one of the preceding claims characterised in that there is provided sensing means (30, 35) which can be operated by a player when the player is in a suitable playing position but which is operative to give rise to a warning signal if and when the player moves from that agreed position.

13. An amusement device according to any one of the preceding claims characterised in that the biasing means comprises a motor (19) and a slipping clutch (20) connected to the motor so as to transmit torque from the motor.

14. An amusement device according to any one of the preceding claims characterised in that the reaction member or each reaction member is constrained to follow a part-circular path and comprises a handle (16) on an arm (15) mounted for rotation about an axis transverse to the arm.

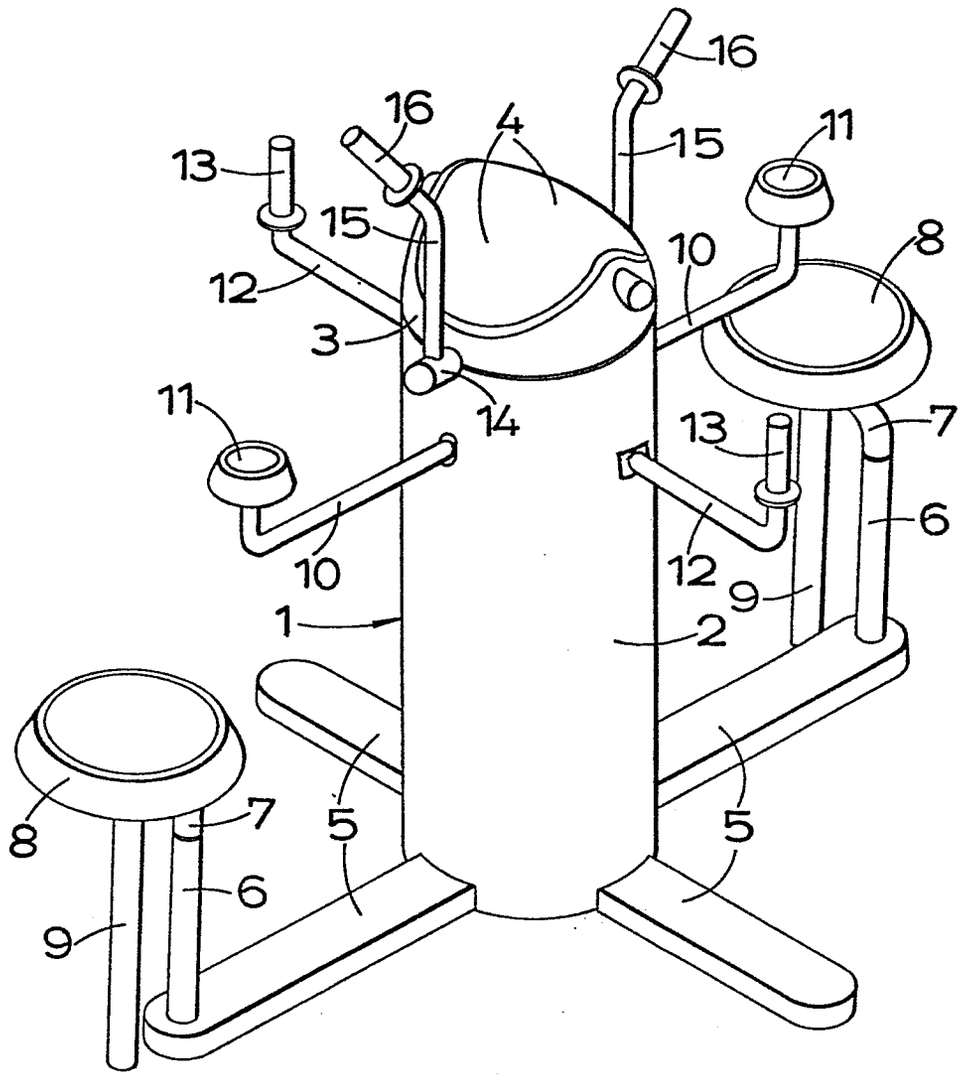

FIG. 1.

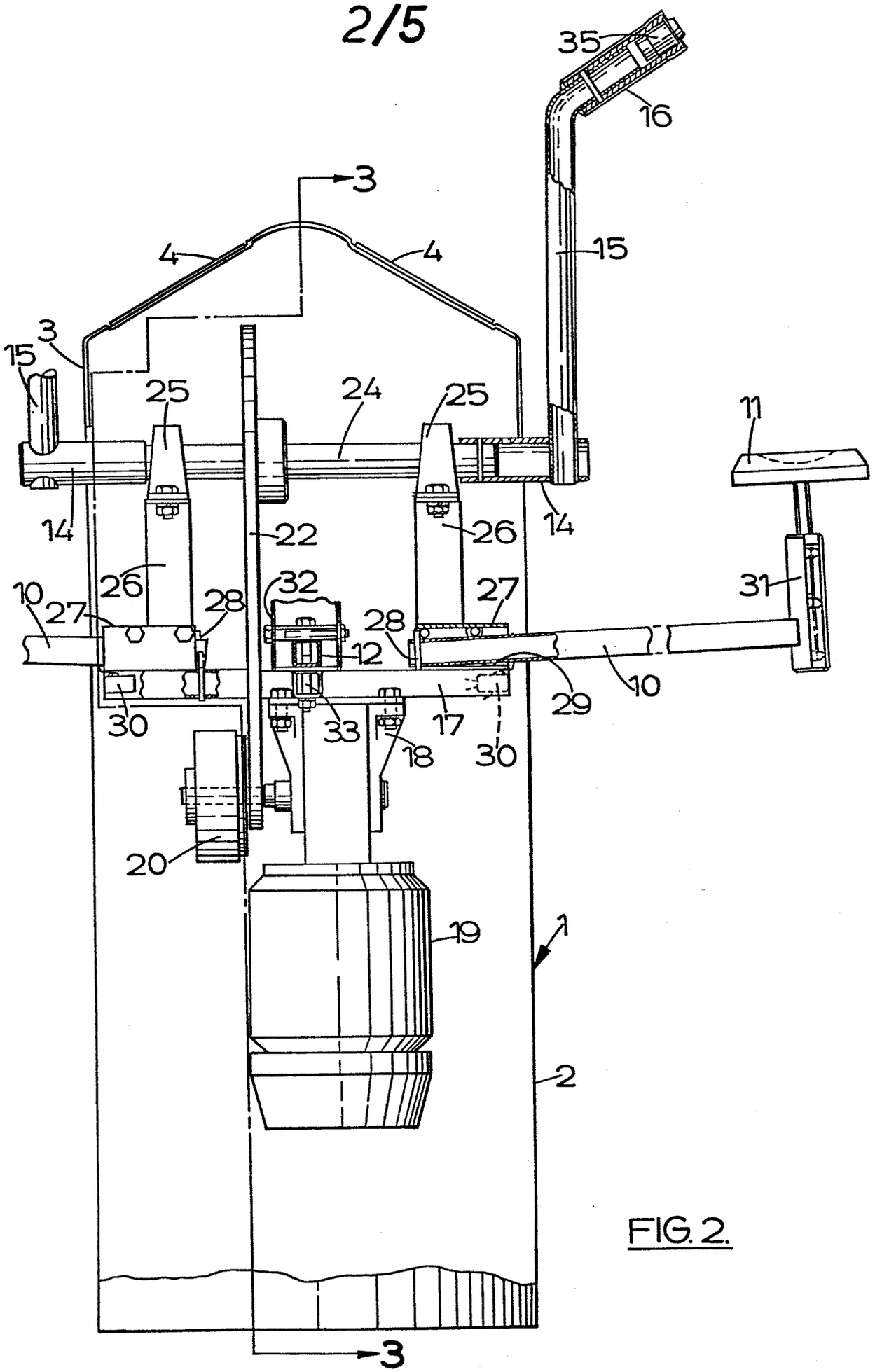
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FIG. 2.

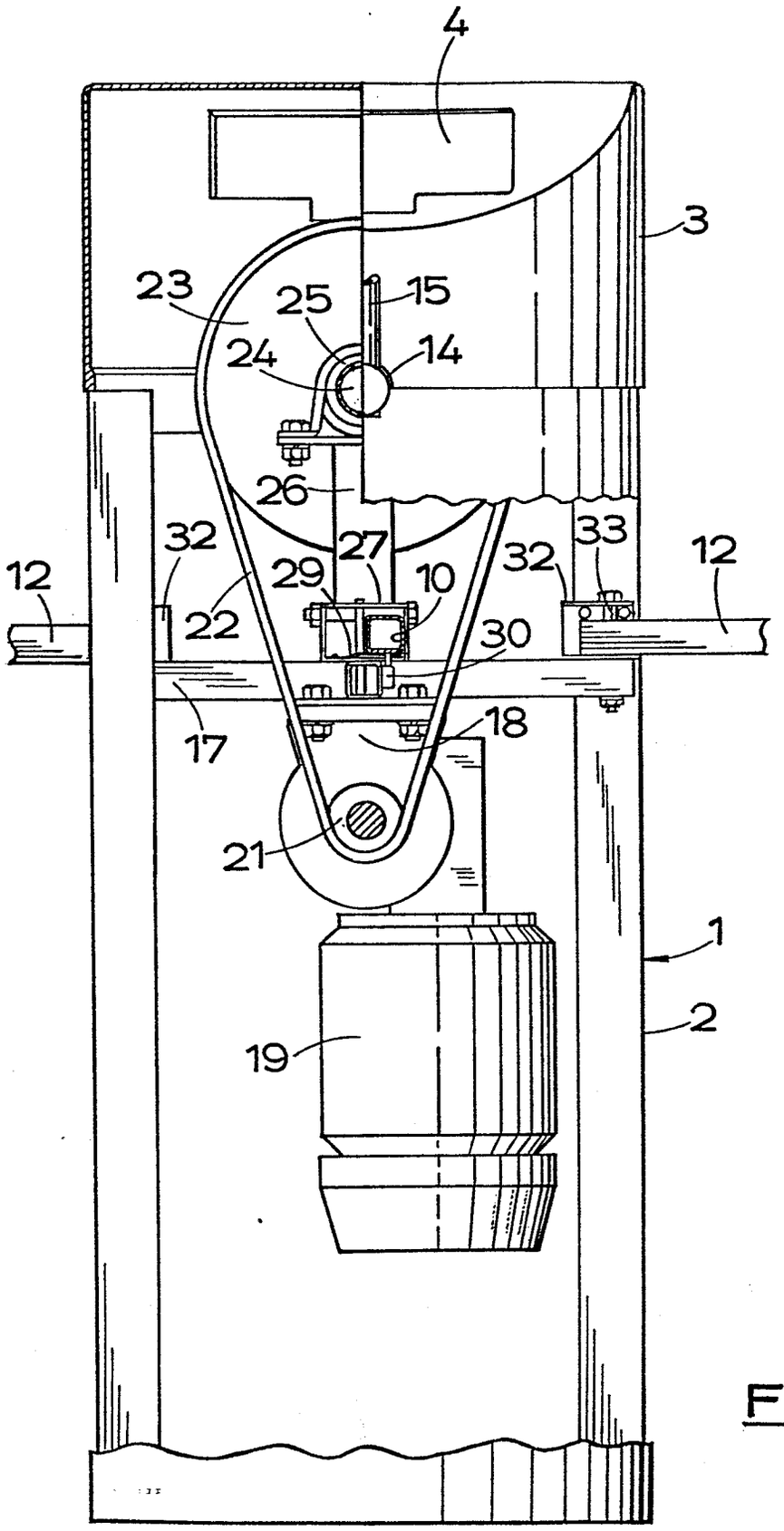

FIG.3.

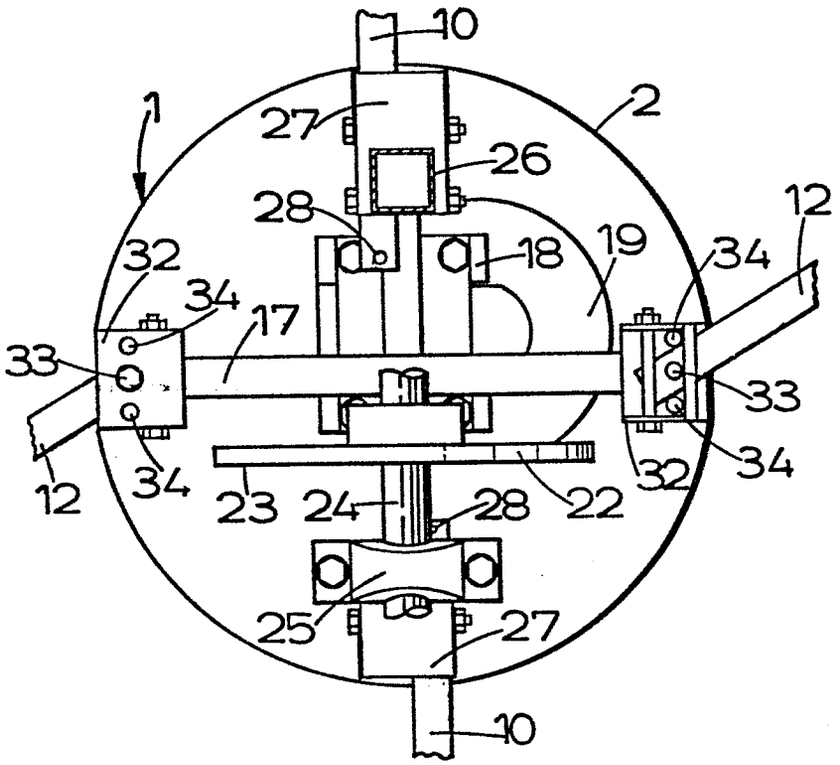
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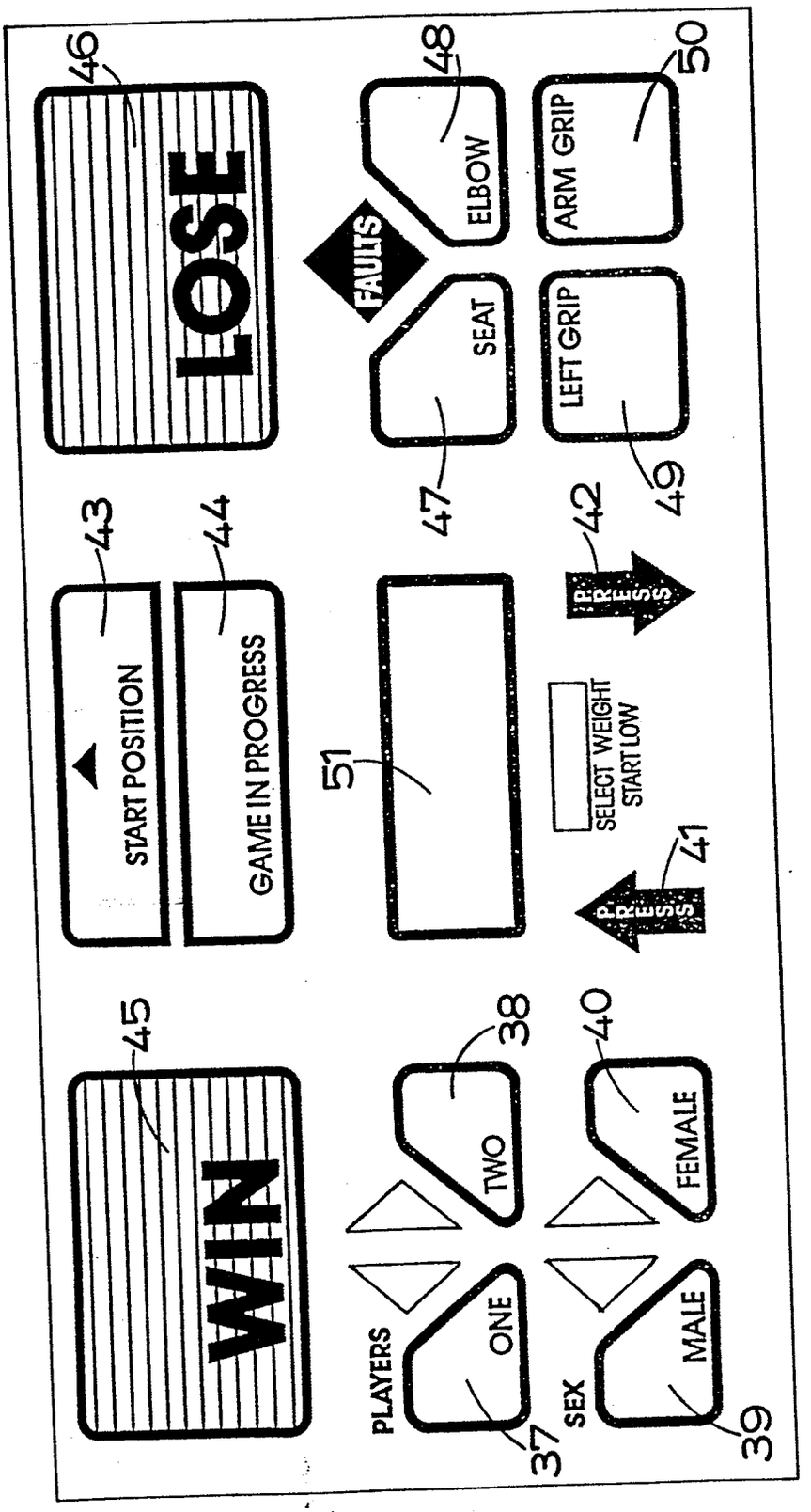
FIG. 4.


46
LOSE
43
START POSITION
44
GAME IN PROGRESS
48
ELBOW
FAULTS
47
SEAT
LEFT GRIP
49
42
50
ARM GRIP
51
SELECT WEIGHT
START LOW
41
45
WIN
PLAYERS
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TWO
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SEX
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39
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FIG.5.