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(54) **CONSOLE-MOUNTED TRANSMISSION
SHIFTER WITH FOLD-FLAT POSITION**

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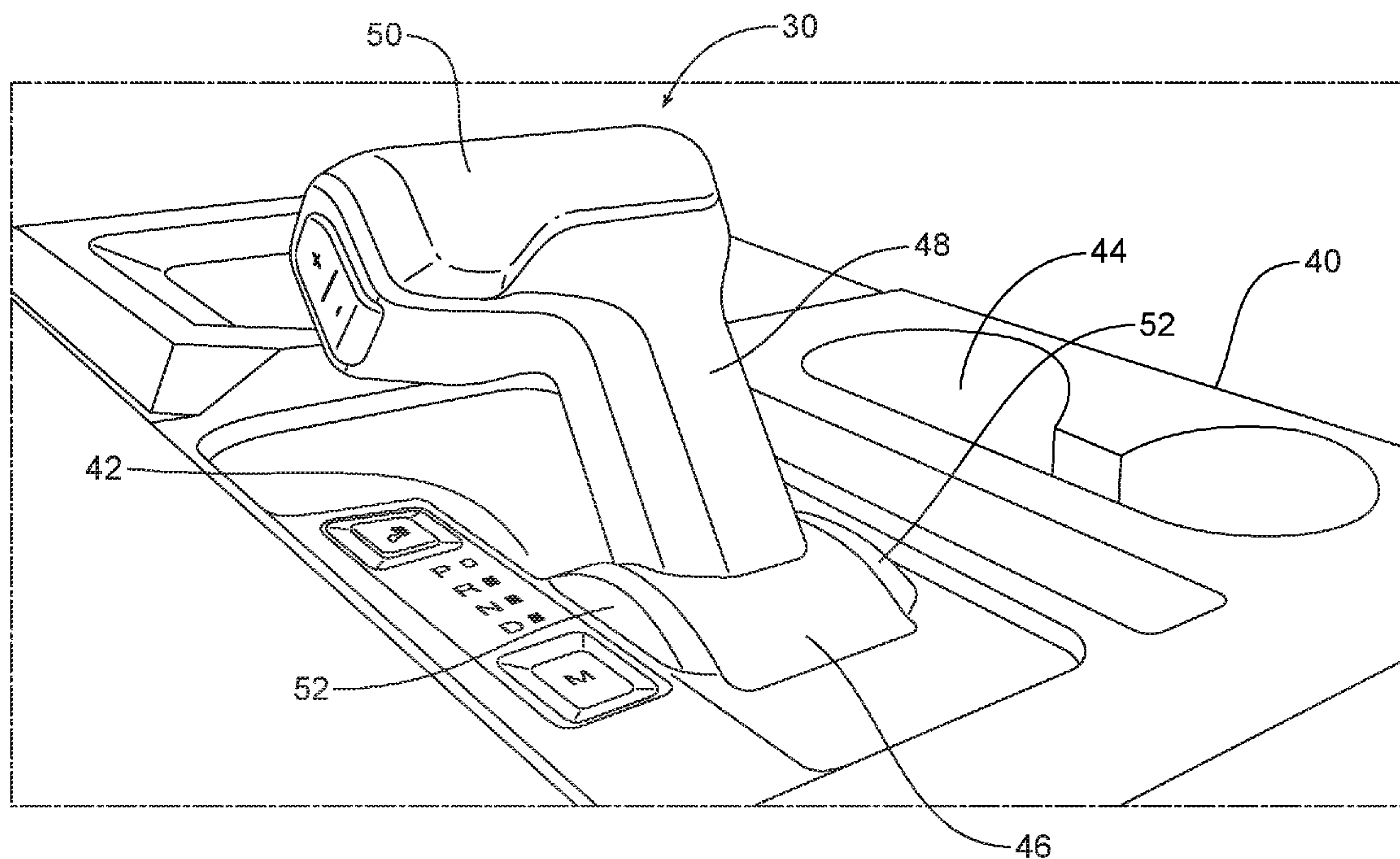
(57) **ABSTRACT**

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Related U.S. Application Data

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24, 2017.

A transmission shifter includes a shifter body displaceable
between (a) a plurality of transmission mode defining posi-
tions and (b) a storage position wherein the shifter body is
held in a shifter receiver provided in a console of a motor
vehicle.



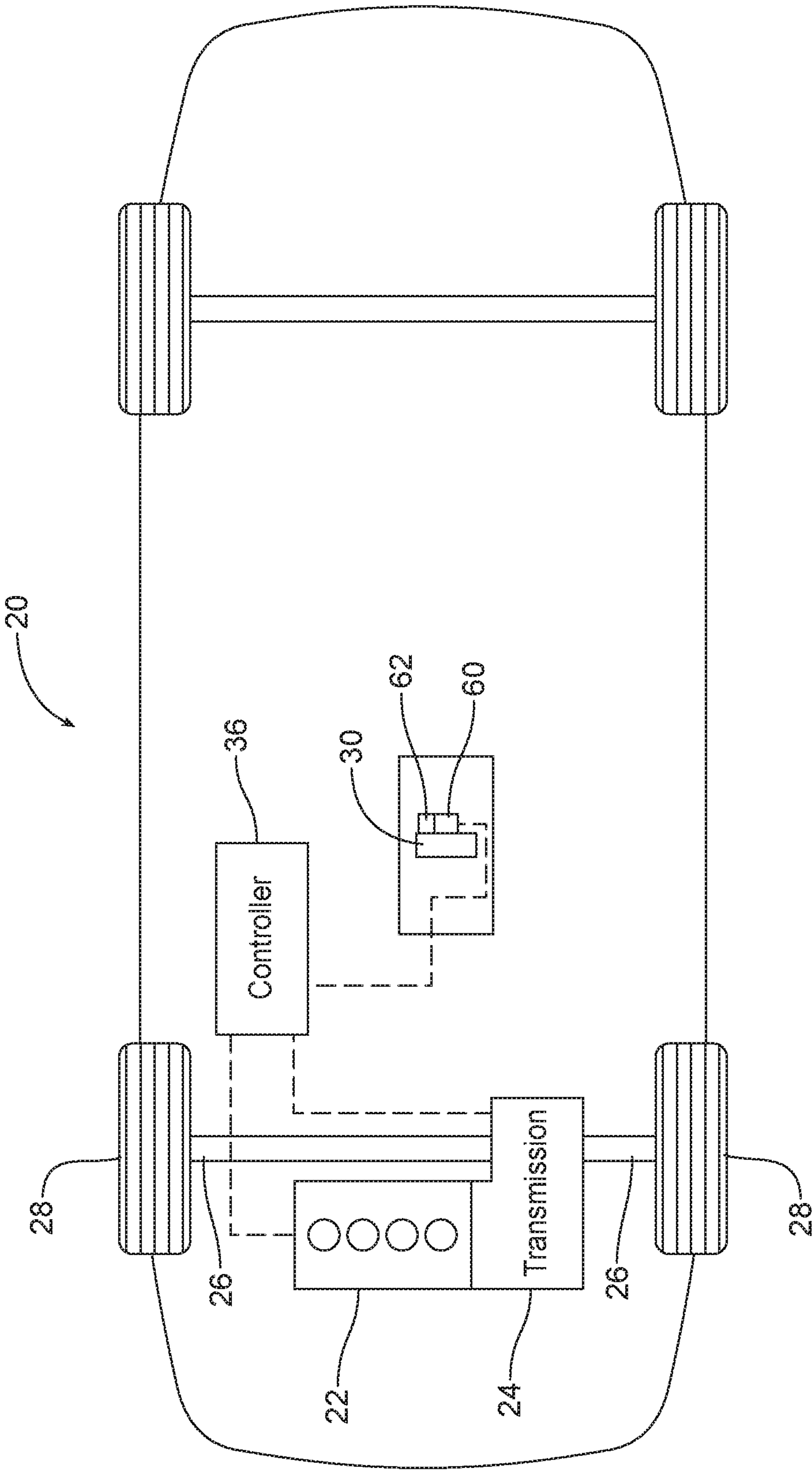


FIG. 1

FIG. 2

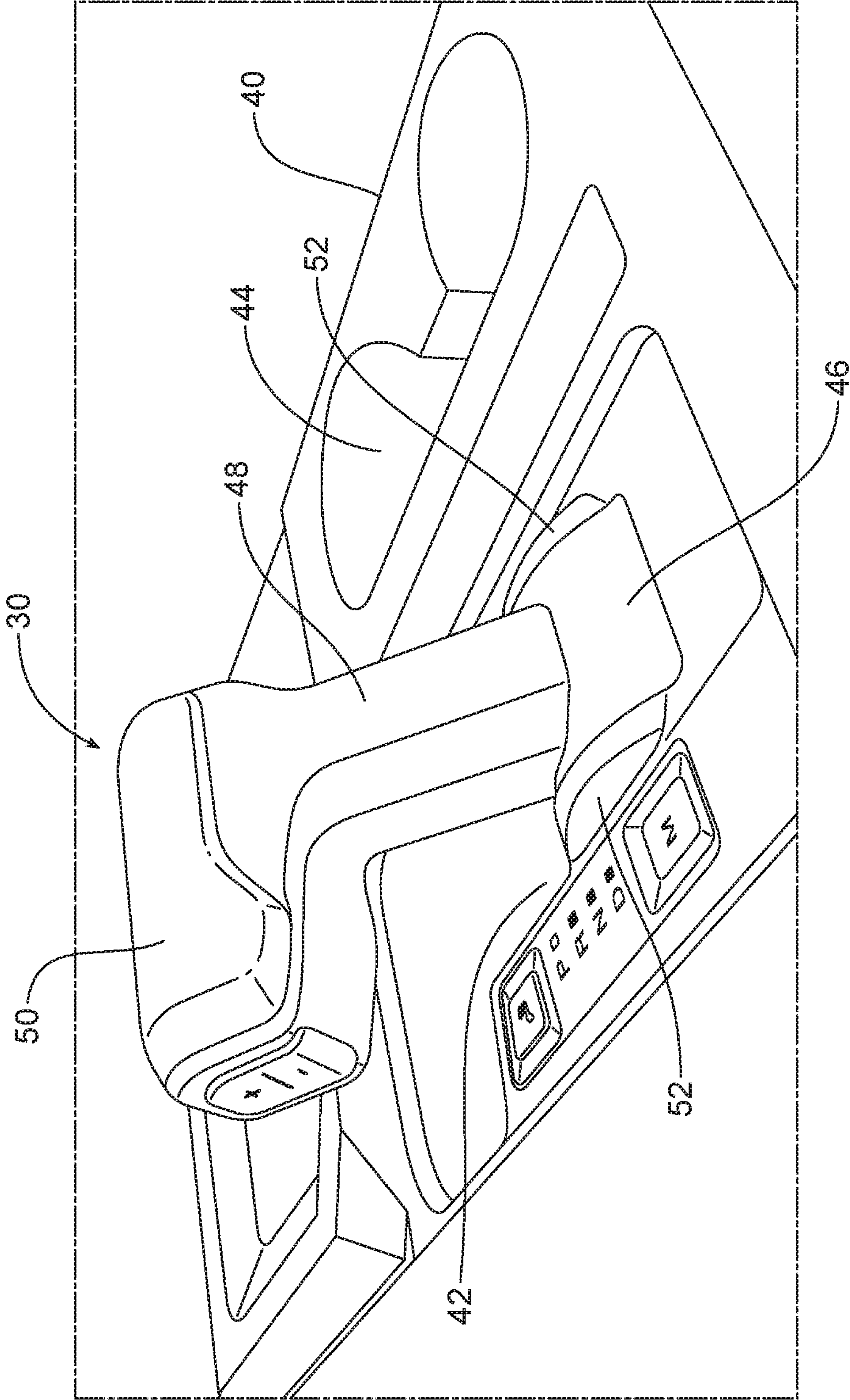


FIG. 3

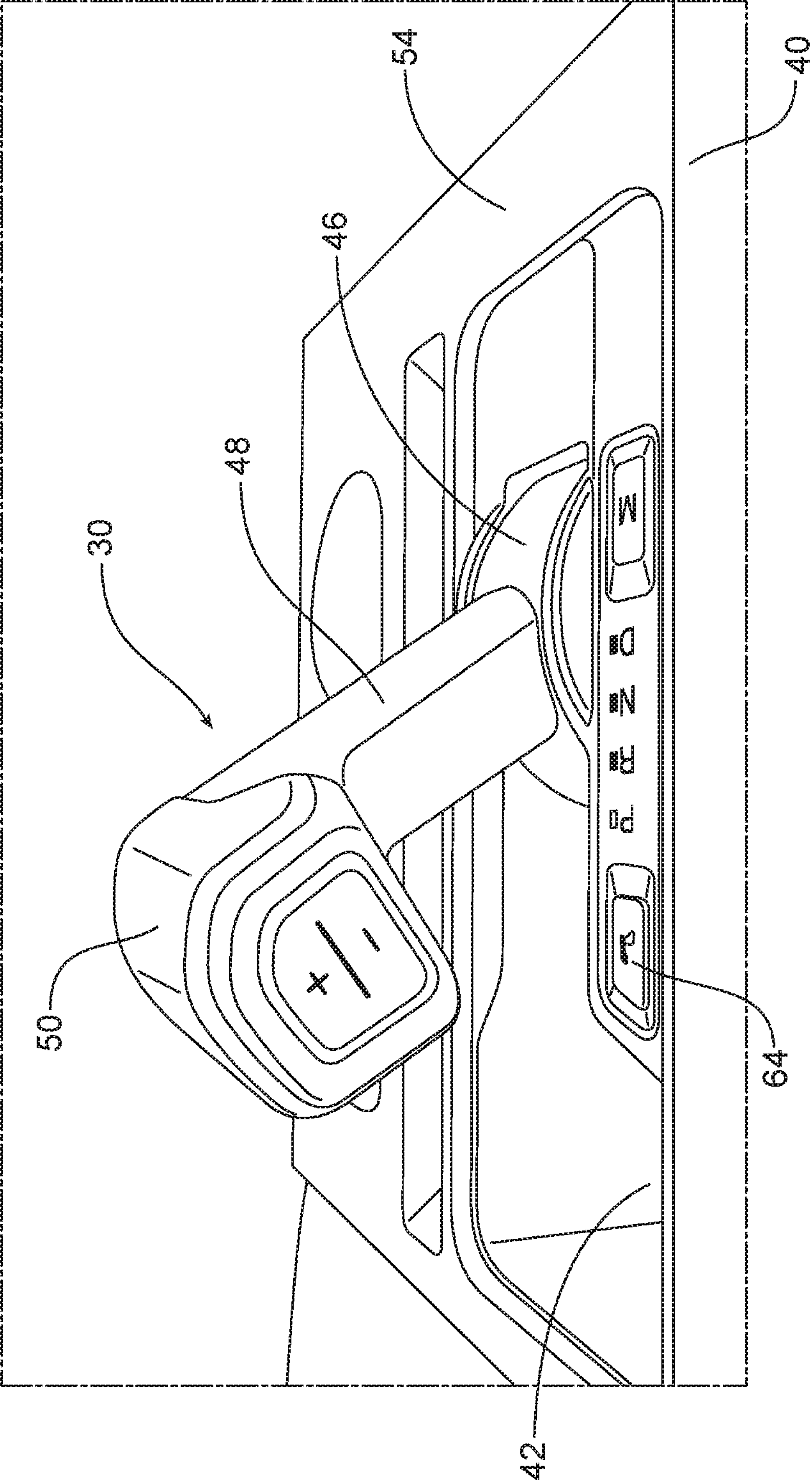


FIG. 4

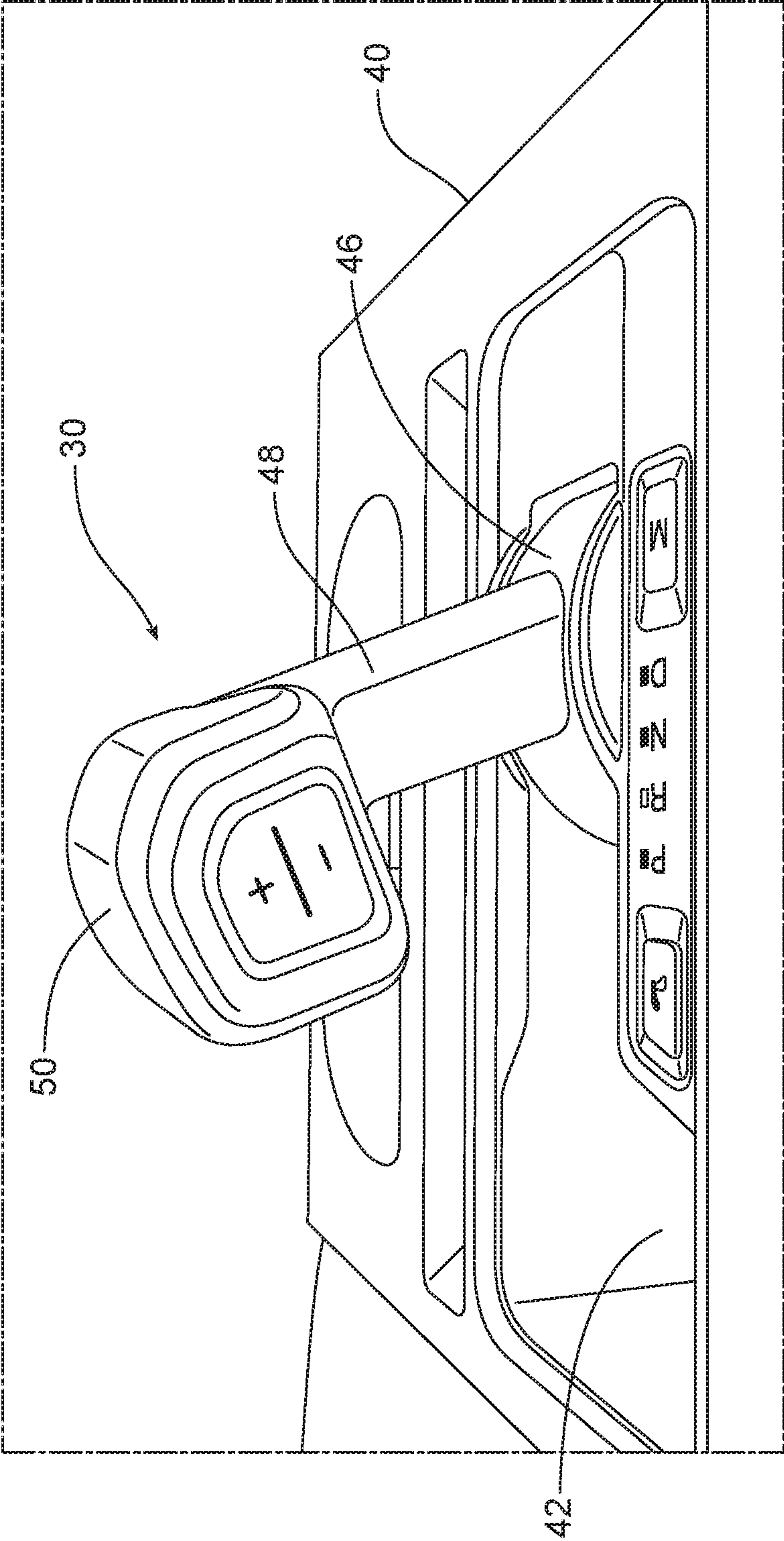


FIG. 5

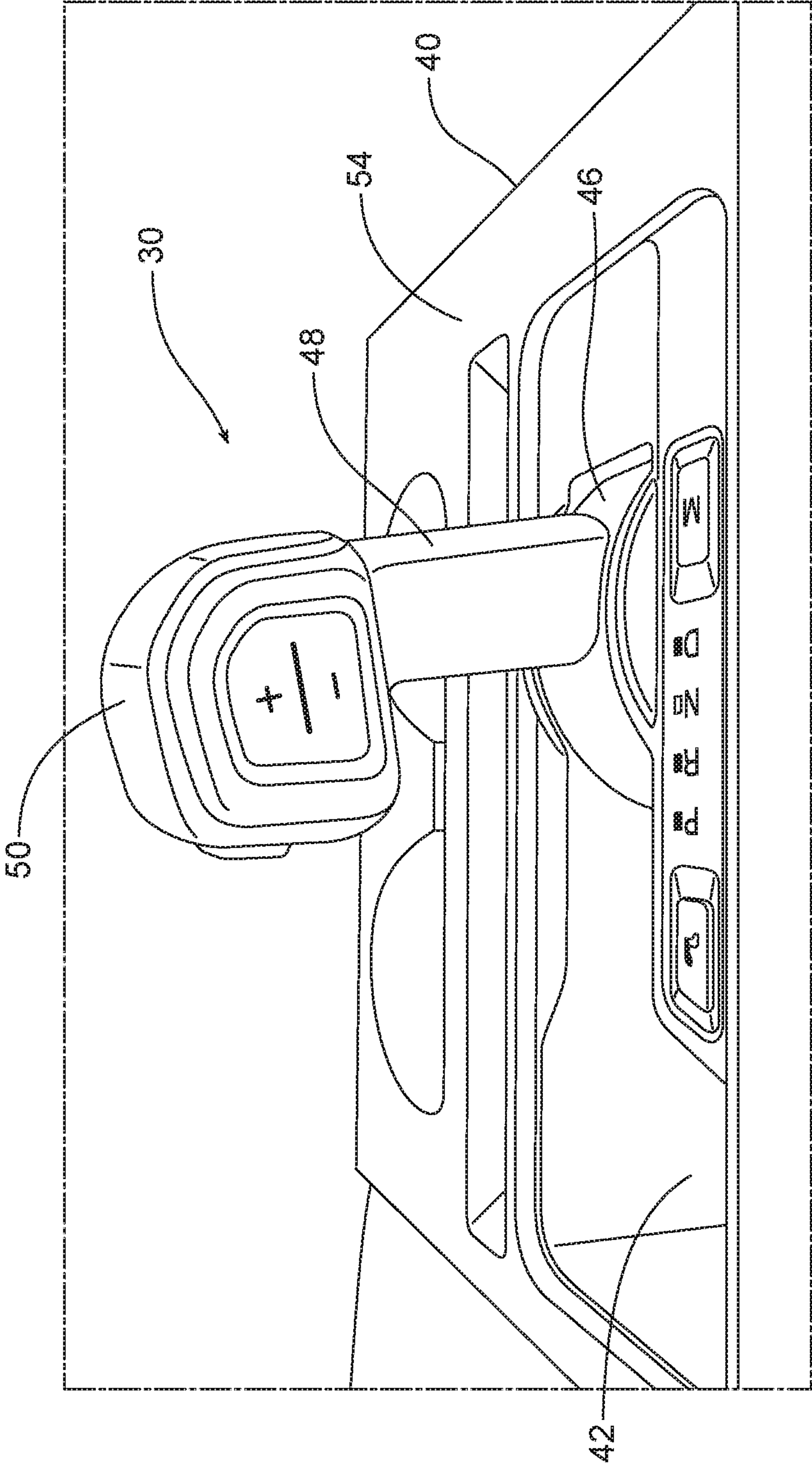


FIG. 6

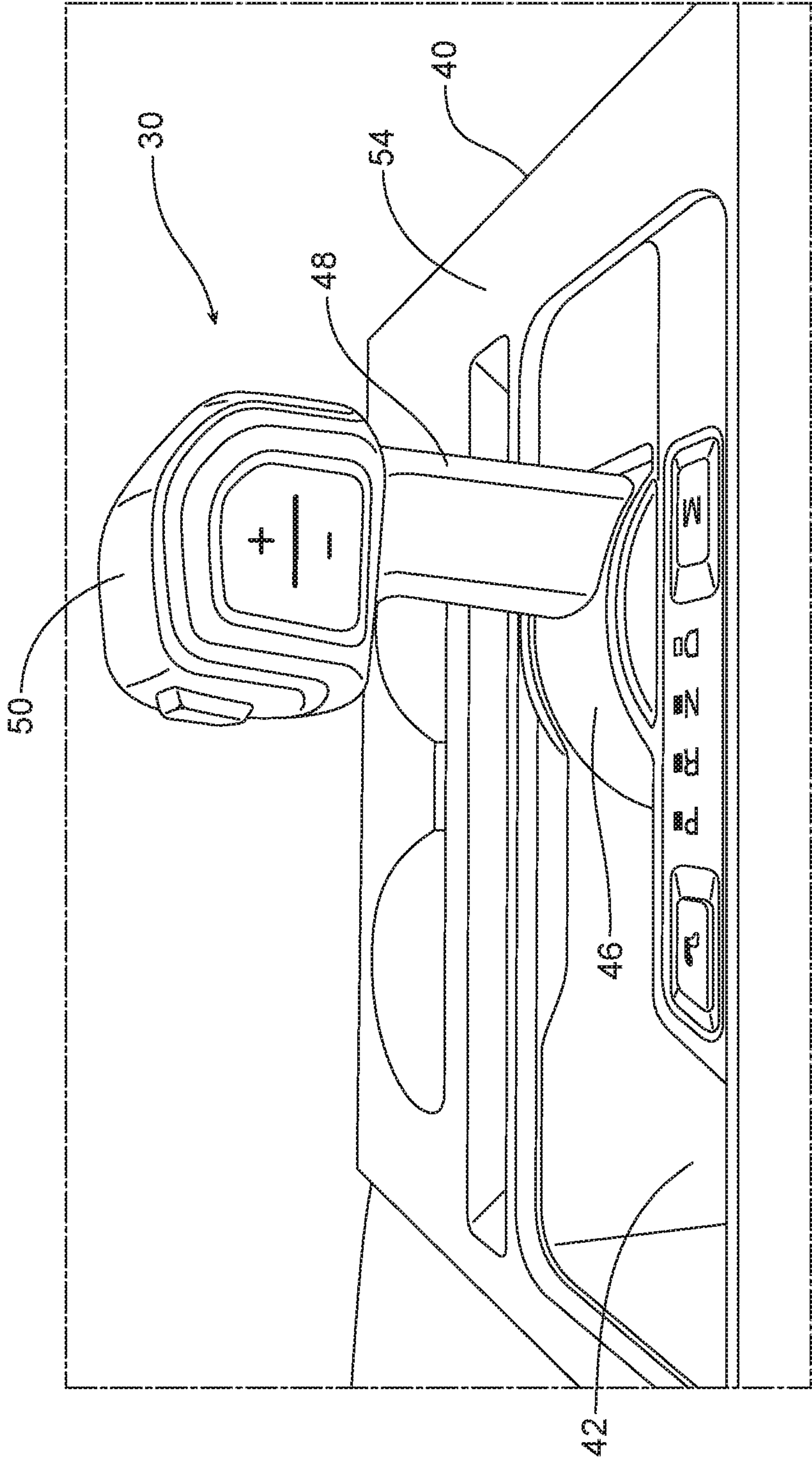


FIG. 7

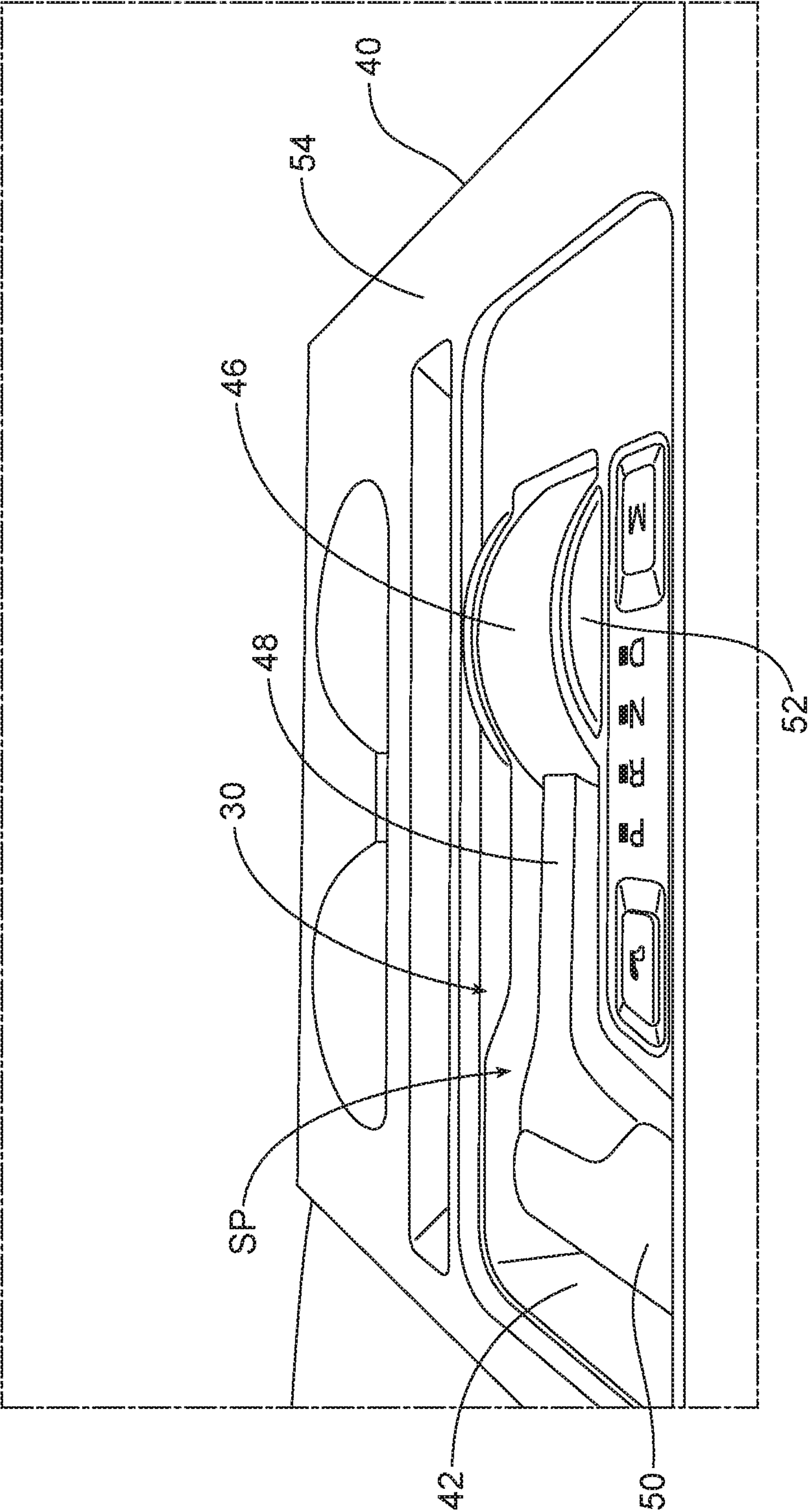
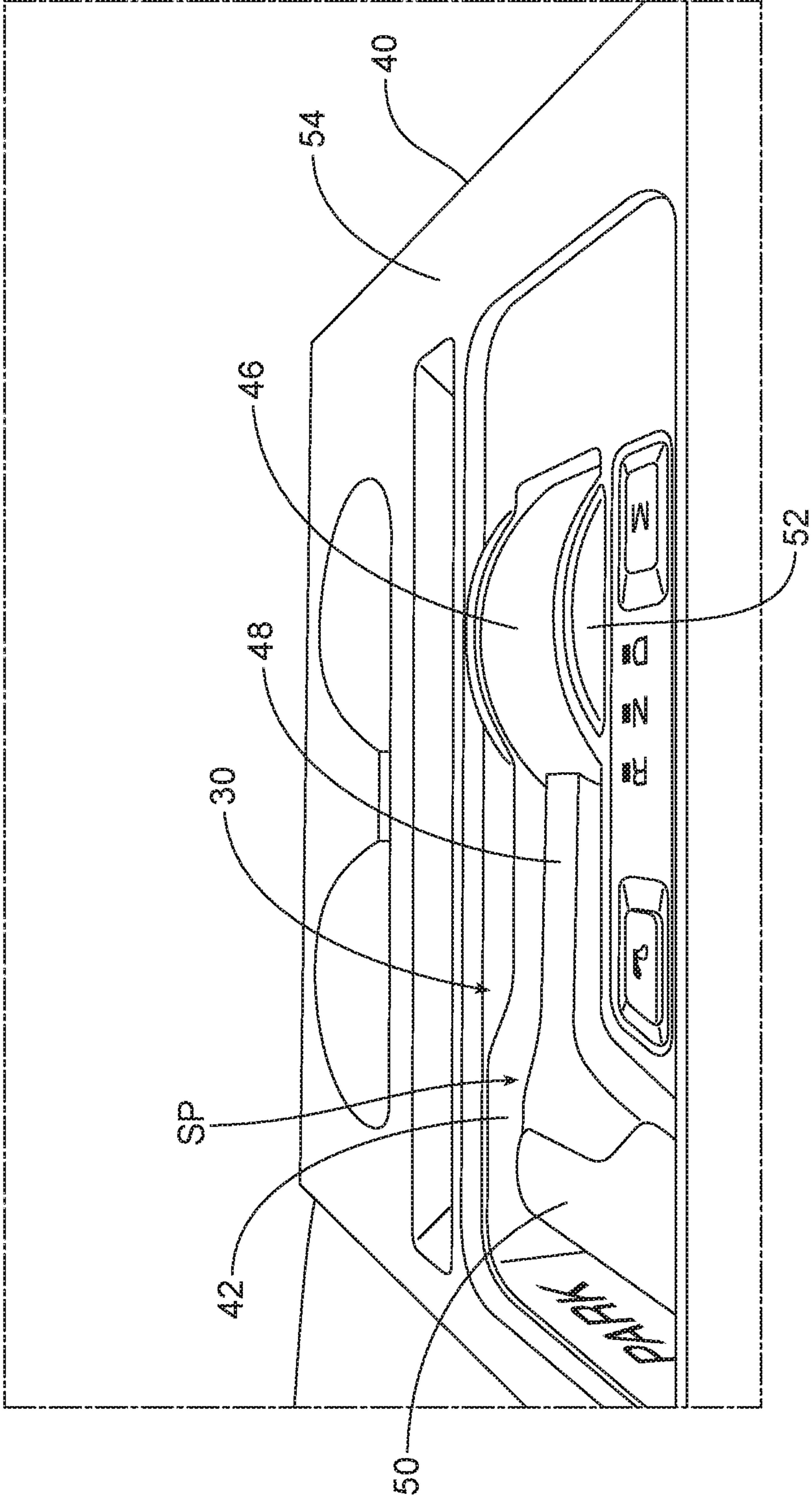


FIG. 8



CONSOLE-MOUNTED TRANSMISSION SHIFTER WITH FOLD-FLAT POSITION

[0001] This application claims the benefit of provisional patent application Ser. No. 62/463,390 filed on 24 Feb. 2017, the full disclosure of which is incorporated by reference.

TECHNICAL FIELD

[0002] This disclosure relates to a manually operated gear shifter for selecting between modes of a transmission, and more specifically to a gear shifter that is displaceable to a storage position.

BACKGROUND

[0003] Motor vehicles include a powertrain that transmits torque to the driven wheels to propel the vehicle. The powertrain includes an engine and a transmission. The transmission is operable to change a speed ratio between an input connected to the engine and an output connected to the driven wheels. The speed ratios are created by planetary gear sets disposed within the gear box. A series of clutches and brakes control the planetary gear sets to establish one or more power flow paths between the input and output. The transmission includes a plurality of modes such as PARK, REVERSE, NEUTRAL, and DRIVE.

[0004] A gear shifter associated with the transmission is disposed within a passenger cabin of the vehicle. The gear shifter includes a plurality of transmission mode defining positions such as PARK, REVERSE, NEUTRAL, and DRIVE that each correspond to one of the transmission modes. Movement of the gear shifter causes one or more of the clutches and brakes to engage or disengage placing the transmission in the driver-selected mode.

SUMMARY

[0005] In accordance with the purposes and benefits described herein, a transmission shifter is provided for mounting on a console of a motor vehicle. That transmission shifter includes a shifter body that is displaceable between (a) a plurality of transmission mode defining positions wherein the shifter body projects from a receiver in the console and (b) a storage position wherein the shifter body is held in the receiver.

[0006] The shifter body may include a base, a shaft and a handle. The base may be provided at a first end of the shaft. The handle may be provided at a second end of the shaft. The transmission shifter may further include a pivot and the shifter body may be angularly displaced about the pivot between the plurality of transmission mode defining positions and the storage position.

[0007] The transmission shifter may also include a lock feature that when locked, prevents the shifter body from being displaced into the storage position. Further, the transmission shifter may include a release feature to release the lock feature and allow the shifter body to be displaced into the storage position. The transmission shifter may include a releasable latch to selectively secure the shifter body in the storage position.

[0008] In at least one of the many possible embodiments of the transmission shifter, the plurality of mode defining positions include a PARK position, a REVERSE position, a NEUTRAL position and a DRIVE position. The PARK position is provided between the storage position and the

REVERSE position. When the shifter body is in the storage position, it may nest in a shifter receiver. That shifter receiver may comprise a recess in the surrounding console of the motor vehicle.

[0009] In at least one of the many possible embodiments, the plurality of transmission mode defining positions include a REVERSE position, a NEUTRAL position and a DRIVE position. The storage position may define a PARK position/transmission mode. When the shifter body is in the storage position, it may nest in a shifter receiver. That shifter receiver may comprise a recess in the surrounding console of the motor vehicle.

[0010] In accordance with yet another aspect, a method is provided for shifting a transmission shifter. That method includes the step of displacing a transmission shifter from a transmission mode defining position wherein the transmission shifter projects from a console into a storage position wherein the transmission shifter is held in a shifter receiver in the console.

[0011] The method may also include the step of releasing a lock before displacing the shifter receiver into the storage position. The method may include the step of holding the transmission shifter in the storage position within the shifter receiver below an upper surface of the console.

[0012] In the following description, there are shown and described several preferred embodiments of the transmission shifter. As it should be realized, the transmission shifter is capable of other, different embodiments and its several details are capable of modification in various, obvious aspects all without departing from the transmission shifter as set forth and described in the following claims. Accordingly, the drawings and descriptions should be regarded as illustrative in nature and not as restrictive.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] The accompanying drawing figures incorporated herein and forming a part of the specification, illustrate several aspects of the transmission shifter and the related method of shifting a transmission shifter and together with the description serve to explain certain principles thereof.

[0014] FIG. 1 is a schematic diagram of a vehicle.

[0015] FIG. 2 is a perspective view of a passenger cabin of the vehicle and illustrates a transmission shifter according to one or more embodiments of this disclosure.

[0016] FIG. 3 is a side view illustrating the transmission shifter in PARK.

[0017] FIG. 4 is a side view illustrating the transmission shifter in REVERSE.

[0018] FIG. 5 is a side view illustrating the transmission shifter in NEUTRAL.

[0019] FIG. 6 is a side view illustrating the transmission shifter in DRIVE.

[0020] FIG. 7 is a perspective view illustrating the transmission shifter folded to a storage position.

[0021] FIG. 8 is a perspective view of an alternative embodiment of transmission shifter wherein the storage position corresponds to the "PARK" position/transmission mode.

[0022] Reference will now be made in detail to the present preferred embodiments of the transmission shifter, examples of which are illustrated in the accompanying drawing figures.

DETAILED DESCRIPTION

[0023] Embodiments of the present disclosure are described herein. It is to be understood, however, that the disclosed embodiments are merely examples and other embodiments can take various and alternative forms. The figures are not necessarily to scale; some features could be exaggerated or minimized to show details of particular components. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a representative basis for teaching one skilled in the art to variously employ the present transmission shifter. As those of ordinary skill in the art will understand, various features illustrated and described with reference to any one of the figures can be combined with features illustrated in one or more other figures to produce embodiments that are not explicitly illustrated or described. The combinations of features illustrated provide representative embodiments for typical applications. Various combinations and modifications of the features consistent with the teachings of this disclosure, however, could be desired for particular applications or implementations.

[0024] An example front-wheel-drive vehicle 20 is schematically illustrated in FIG. 1. It is to be understood, however, that the vehicle could be rear-wheel drive, four-wheel drive, or all-wheel drive. The vehicle 20 includes an engine 22 coupled to a transmission 24. The transmission 24 transmits power from the engine 22 to a differential at a shaft speed suited to current vehicle needs, which may be faster or slower than the shaft speed at which engine 22 generates power. The differential reduces the shaft speed by a fixed final-drive ratio and transmits the power to the left and right driven wheels 28 via front half shafts 26.

[0025] The vehicle 20 includes a controller 36. The controller 36 may be a vehicle-based computing system that includes one or more controllers that communicate via a serial bus, e.g., Controller Area Network (CAN), or via dedicated electrical conduits. The controller 36 generally includes any number of microprocessors, ASICs, ICs, memory, e.g., FLASH, ROM, RAM, EPROM and/or EEPROM, and software code to co-act with one another to perform a series of operations. The controller 36 also includes predetermined data, or “look up tables” that are based on calculations and test data, and are stored within the memory. The controller 36 may communicate with other vehicle systems and controllers over one or more wired or wireless vehicle connections using common bus protocols (e.g., CAN and LIN). Used herein, any reference to “a controller” refers to one or more controllers.

[0026] The transmission 24 includes a manually-operated transmission shifter 30 (also known as a gear selector) that includes a plurality of transmission mode defining positions including at least PARK, REVERSE, NEUTRAL, and DRIVE positions. The transmission shifter 30 is linked to the transmission 24, either electrically or mechanically, to place the transmission 24 in the mode selected by the driver.

[0027] Referring to FIG. 2, the vehicle 20 includes a passenger cabin having a center console 40 disposed between the front seats of the vehicle. The center console 40 defines a shifter receiver 42 and a cup holder 44 adjacent to the shifter receiver 42. The transmission shifter 30 is connected to the center console 40 and includes at least a portion disposed within the shifter receiver 42. The transmission shifter 30 comprises a shifter body including a base 46 pivotally attached to the center console 40, a shaft 48

extending from the base, and a handle 50. Thus, the base 46 is provided at a first end of the shaft and the handle 50 is provided at a second end of the shaft.

[0028] The shifter base 46 may be pivotally attached to the center console 40 by a pivot such as a pin connection, a hinge, or other means known in the art. For example, the shifter receiver 42 may include opposing sidewalls 52 that define an aperture for receiving a pin that extends through the base 46. The transmission shifter 30 is pivoted about the connection between a plurality of angular positions, each corresponding to one of: PARK, NEUTRAL, REVERSE, DRIVE, and potentially others, e.g., LOW. To change the mode of the transmission 24, a driver pivots the transmission shifter 30 about the pivot point to place the transmission shifter 30 in the angular position of the desired mode. One or more detents may be provided in the shifter base 46 and/or the sidewalls 52 to secure the transmission shifter 30 in one of the plurality of positions and provide feedback to the driver.

[0029] More specifically, as illustrated in FIGS. 2 and 3, the PARK position of the transmission shifter 30 is at a forward-most angle. As illustrated in FIG. 6, the DRIVE position is a rear-most angle, and the NEUTRAL and REVERSE positions (see FIGS. 4 and 5 respectively) are therebetween. For example, the shaft 48 may form a 60° angle with a top 54 of the center console 40 when in PARK, may form a 75° angle when in REVERSE, may form a 90° angle when in NEUTRAL, and may form a 105° angle when in DRIVE and a fold-flat, 0° angle when in the storage position that is illustrated in FIG. 7 and described in greater detail below. These angular positions are but one example, and many other angular positions may be used for the various transmission modes.

[0030] Referring back to FIG. 1, the transmission shifter 30 may be electronically connected to the transmission 24 by a wired or wireless connection. For example, a sensor 60 may be disposed in the base 46 of the shifter 30 or in the center console 40. The sensor 60 is configured to sense an angular position of the shifter 30 and output a signal indicative of the angular position of the shifter to the controller 36. In some embodiments, the sensor 60 may be configured to determine which mode the shifter 30 is in, e.g., PARK, and output a signal to the controller 36 indicative of the currently selected mode. The controller 36 processes the signal from the sensor 60 and outputs a signal to the transmission 24 that commands the transmission to the driver-selected mode.

[0031] Referring to FIG. 7, console-mounted shifters are ergonomic for the driver, but take up console space and may limit possible console features that would be possible but for the shifter being in the way. The transmission shifter 30 includes a storage position SP in which the shifter is folded flat into the shifter receiver 42 placing the shifter 30 out of the way. In some embodiments, the shifter 30 nests within the shifter receiver 42, which is recessed into the console, so that the entire shifter 30 is below the top 54 of the center console 40 when in the storage position SP. The transmission shifter 30 may be displaced to the storage position SP when the vehicle is in PARK and remains in PARK when so displaced. The shifter 30 may be pivoted to the storage position SP by rotating the shaft 48 past the PARK position. The shifter 30 may include a lock 62 (see FIG. 1) that prevents the transmission shifter 30 from being pivoted to the storage position inadvertently. A release 64 (see FIG. 3),

such as a button, may be located on the console **40** adjacent the transmission shifter **30** and operable to unlock the shifter allowing the shifter **30** to be rotated to the storage position SP.

[0032] In yet another embodiment, a cover is deployable over the shifter receiver **42** when the shifter **30** is in the storage position. The cover includes a top surface that is substantially flush with the top of the center console, i.e., within 0.5 millimeters of each other, to create a work surface suitable for writing or other tasks. A second cover may be deployable over the cup holders to increase the size of the work surface.

[0033] FIG. **8** illustrates another possible embodiment of the transmission shifter **30** wherein the plurality of mode defining positions selected when the transmission shifter projects from the shifter receiver **42** in the console **40** include the REVERSE position, the NEUTRAL position and the DRIVE position. In this embodiment the PARK position/transmission mode corresponds to the storage position SP wherein the transmission shifter **30** is fully received within the shifter receiver, recessed below the upper or top surface **54** of the console **40**.

[0034] While exemplary embodiments are described above, it is not intended that these embodiments describe all possible forms encompassed by the claims. The words used in the specification are words of description rather than limitation, and it is understood that various changes can be made without departing from the spirit and scope of the disclosure. As previously described, the features of various embodiments can be combined to form further embodiments of the transmission shifter that may not be explicitly described or illustrated. While various embodiments could have been described as providing advantages or being preferred over other embodiments or prior art implementations with respect to one or more desired characteristics, those of ordinary skill in the art recognize that one or more features or characteristics can be compromised to achieve desired overall system attributes, which depend on the specific application and implementation. As such, embodiments described as less desirable than other embodiments or prior art implementations with respect to one or more characteristics are not outside the scope of the disclosure and can be desirable for particular applications.

What is claimed:

- 1.** A transmission shifter for mounting on a console of a motor vehicle, comprising:
 - a shifter body displaceable between (a) a plurality of transmission mode defining positions wherein said shifter body projects from a shifter receiver in said console and (b) a storage position wherein said shifter body is held in said shifter receiver.
- 2.** The transmission shifter of claim **1**, wherein said shifter body includes a base, a shaft and a handle.

3. The transmission shifter of claim **2**, wherein said base is provided at a first end of said shaft and said handle is provided at a second end of said shaft.

4. The transmission shifter of claim **3**, further including a pivot, said shifter body being angularly displaced about said pivot between said plurality of transmission mode defining positions and said storage position.

5. The transmission shifter of claim **4**, further including a lock feature that when locked prevents said shifter body from being displaced into said storage position.

6. The transmission shifter of claim **5**, further including a release feature to release said lock feature and allow said shifter body to be displaced into said storage position.

7. The transmission shifter of claim **6**, including a releasable latch to selectively secure said shifter body in said storage position.

8. The transmission shifter of claim **4**, wherein said plurality of transmission mode defining positions include a PARK position, a REVERSE position, a NEUTRAL position and a DRIVE position.

9. The transmission shifter of claim **8**, wherein said PARK position is between said storage position and said REVERSE position.

10. The transmission shifter of claim **9**, wherein said shifter body nests in the shifter receiver when in said storage position.

11. The transmission shifter of claim **4**, wherein said plurality of transmission mode defining positions include a REVERSE position, a NEUTRAL position and a DRIVE position and said storage position defines a PARK POSITION.

12. The transmission shifter of claim **11**, wherein said shifter body nests in the shifter receiver when in said storage position.

13. A method of shifting a transmission shifter, comprising:

displacing a transmission shifter from a transmission mode defining position wherein said transmission shifter projects from a console into a storage position wherein said transmission shifter is held in a shifter receiver in said console.

14. The method of claim **13**, including releasing a lock before displacing said transmission shifter into said storage position.

15. The method of claim **14**, including holding said transmission shifter in said storage position within said shifter receiver below an upper surface of said console.

16. The method of claim **13**, including holding said transmission shifter in said storage position within said shifter receiver below an upper surface of said console.

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