Aug. 20, 1968 R. B. BUSH 3,397,912

FLEXIBLE COUPLING FOR A SEAT

Filed June 2, 1965 3 Sheets-Sheet 1

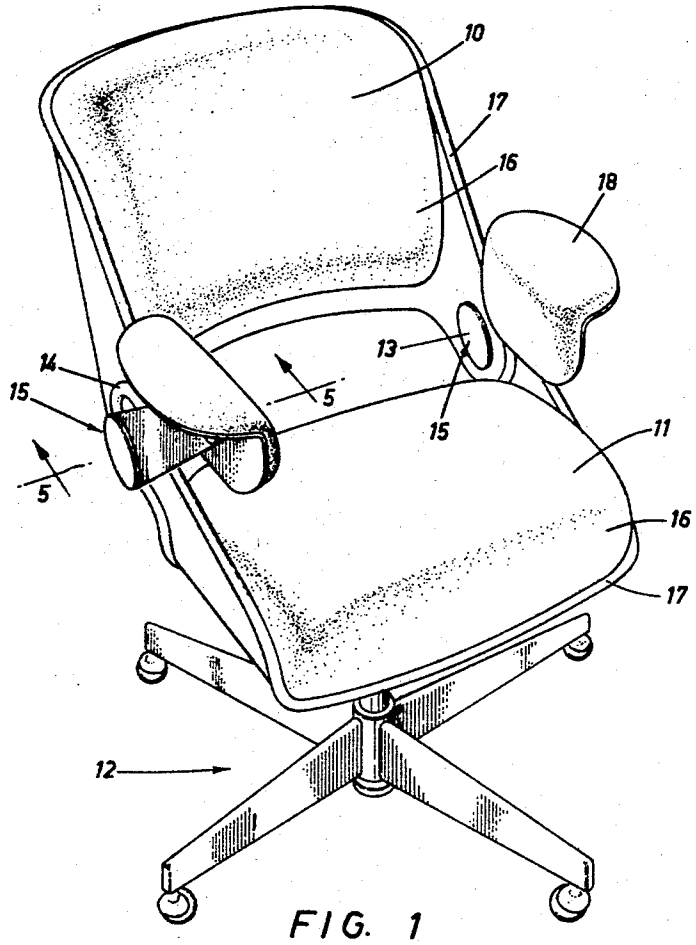


FIG. 1

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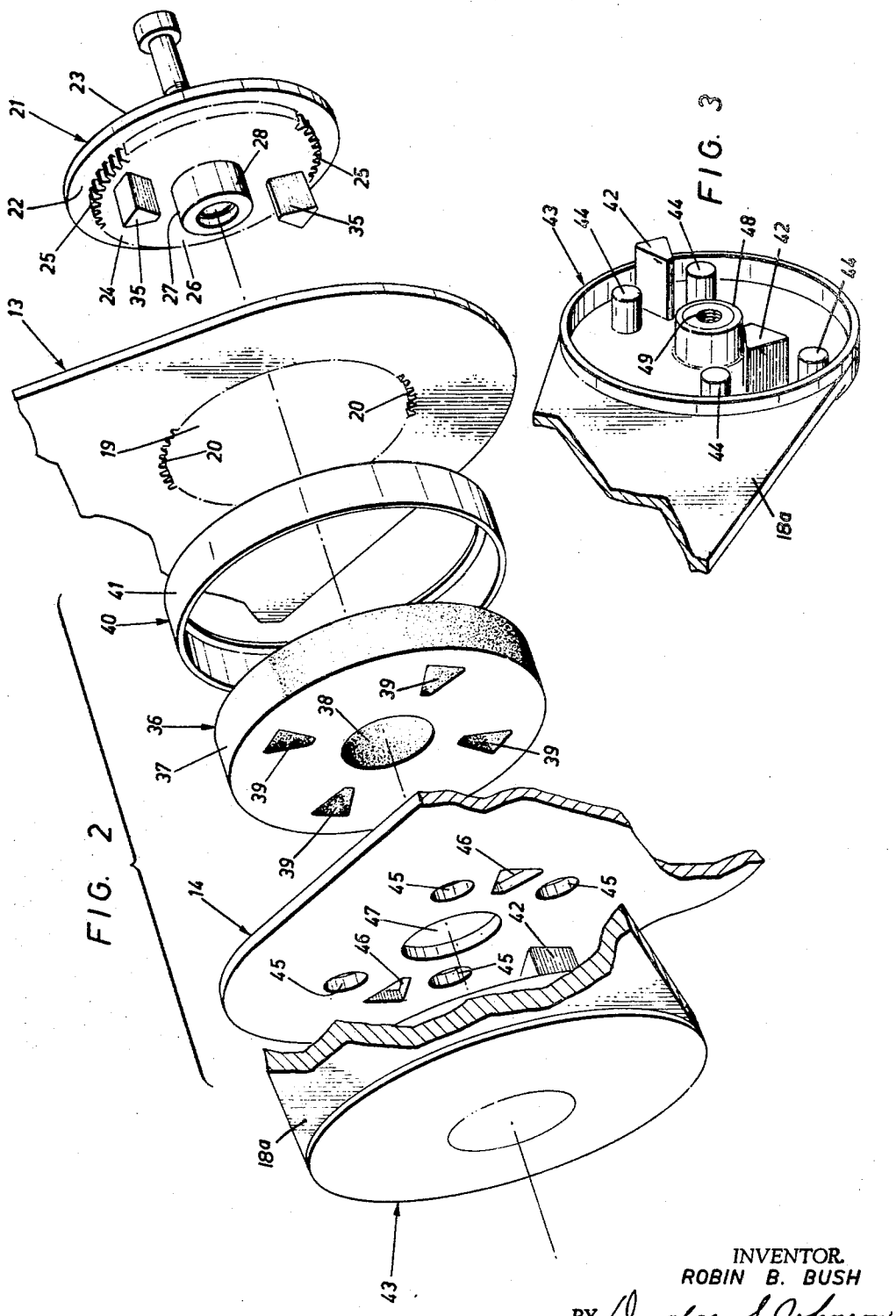


FIG. 2

FIG. 3

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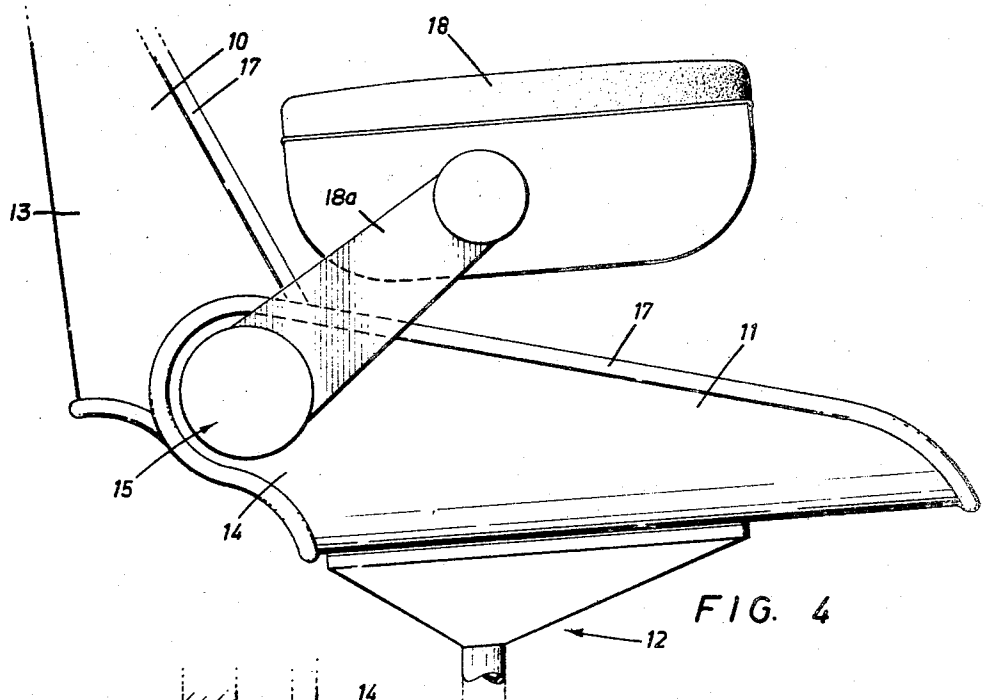


FIG. 4

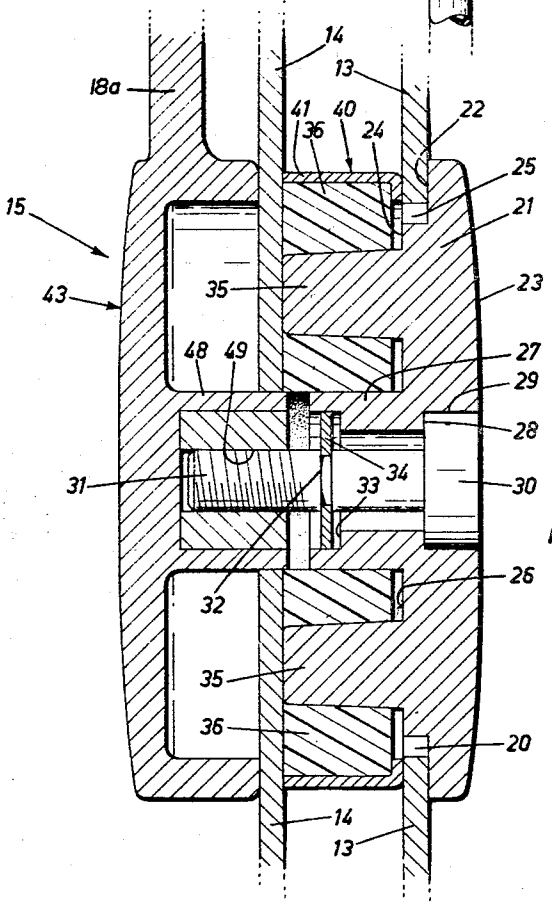


FIG. 5

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3,397,912

FLEXIBLE COUPLING FOR A SEAT

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Claims priority, application Great Britain, June 3, 1964, 23,027/64
1 Claim. (Cl. 297—355)

This invention relates to flexible couplings and more particularly to adjustable flexible couplings embodied in a chair for connecting the seat to other parts, such as the back, to provide a means to comfortably accommodate persons of various sizes.

One object of the invention is to provide an adjustable chair wherein the back is resiliently hinged to the seat and the back is adjustable in a wide range of positions in relation to the seat, each position differing from the next by a small degree.

It is a further object of the invention to provide an attractive adjustable chair wherein the resilient adjustable coupling is concealed from view.

These together with other objects and advantages which will become subsequently apparent reside in the detail of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to the like parts throughout and in which:

FIGURE 1 is a perspective view of a chair incorporating one embodiment of the invention;

FIGURE 2 is an exploded perspective view of a preferred embodiment of the invention;

FIGURE 3 is another view of one of the members shown in FIGURE 2;

FIGURE 4 is a side elevation of a chair showing the arrangement of the seat, back and arm in relation to the flexible coupling of the invention; and

FIGURE 5 is a sectional view showing the flexible coupling of the invention on the lines 5—5 of FIGURE 1.

Referring now to the drawings in detail the preferred embodiment of the chair includes a back **10** and a seat **11** carried by a support member, generally denoted by the numeral **12** which is adjustably secured to the usual radial arms having casters at their outer ends. The back **10** and the seat **11** are advantageously constructed of steel plate shaped as illustrated in FIGURE 1 with the lower part **13** of the back shell **10** and the upper part **14** of the seat shell **11** overlapping, and connected at each side by a flexible coupling, generally denoted by the numeral **15**, to be described later. The back **10** and the seat **11** are suitably covered on their inner surfaces by upholstery **16** which is finished at the edge by molding **17**. In the embodiment shown in FIGURE 1 an arm, generally denoted by the numeral **18**, is connected to the seat **11** by means of the flexible coupling **15**, but the invention is equally applicable to a chair without an arm.

The means for adjusting the position of the back **10** in relation to the seat **11** will now be described. The overlapping lower portion **13** of the back shell **10** has a circular aperture **19**, the wall of which is provided with a series of teeth **20**; by way of example and not by way of limitation the tooth spacing of the teeth **20** subtends an angle of 5°. A lock plate, generally denoted by the numeral **21**, covers the aperture **19**, the flange **22** of the lock plate **21** bearing against the inner surface of the back shell portion **13**. The head **23** of the lock plate **21** is preferably domed for the sake of appearance and is provided with a chrome finish. A circular flange **24** is provided on the inner surface of the lock plate **21** and the edge of the flange **24** has a series of teeth **25** with the same pitch as the series of teeth **20**, thereby providing a lock on engagement.

The lock plate **21** has a centrally disposed abutment **26** and a sleeve **27** traverses the abutment **26** and the head **23** of the lock plate **21**. The sleeve **27** has a shoulder **28** positioned short of the lock plate head **23** which provides a recess **29** for the head **30** of a cap screw **31**. The shank **32** of the screw **31** extends through the sleeve **27** and another shoulder **33** is provided adjacent the opposite end of the sleeve **27** to accommodate a ring **34** which cooperates with the shank **32** to provide a means for retaining the cap screw **31** in the sleeve **27**.

The means for flexibly coupling the back **10** to the seat **1** will now be described. A diametrically opposed pair of spaced apart dowels **35** are provided on the face of the circular flange **24**; the preferred shape of the dowels **35** is illustrated in FIGURE 2 being substantially triangular with the parallel bases each adjacent to the teeth **25**. The spaced apart dowels **35** cooperate with a flexible member **36** separating the opposed surfaces of the lower part **13** of the back shell **10** and the upper part **14** of the seat shell **11**. The flexible member **36** may be a convolute spring secured at its inward end to a sleeve sufficiently large to permit the passage of the shank **32** of the screw **31** with a pair of spaced apart sleeves secured on one face to the turns of the convolute spring to accommodate the dowels **35** in position.

In the preferred embodiment shown in FIGURE 2 the flexible member **36** is a circular plug **37** composed of neoprene having a central aperture **38** large enough to accommodate the passage of the shank **32** of the screw **31**. Intermediate of the aperture **38** and the perimeter of the plug **37** are four equally spaced apertures **39**, either pair of which will accommodate the dowels **35** of the lock plate **21**. The neoprene plug **37** is enclosed by a circular retaining ring **40** having a flange **41** which bears against the surface of the upper part **14** of the seat shell **11**.

The upper part **14** of the seat shell **11** is secured to the flexible member **36** by means of a spaced pair of dowels **42** constructed similarly to the dowels **35** and cooperating with the flexible member **36** in the same manner. The dowels **42** may be integral with the upper part **14** of the seat shell **11** but in the preferred embodiment the dowels **42** are secured to the face of a cap member **43**. Spigots **44** are also secured to the face of the cap member **43** and are conveniently, though not necessarily, positioned on the same circle as the opposed pair of dowels **42**. The spigots **44** cooperate with apertures **45** located on the upper part **14** of the seat shell **11** thereby providing a means for securing through the cap member **43**. A pair of diametrically opposed apertures **46** are also provided in the upper part **14**, these being dimensioned to permit the passage therethrough of the pair of dowels **42**. Finally, an aperture **47** centrally disposed with respect to the apertures **45** is provided in the upper part of the seat shell **11** and this permits the passage therethrough of a centrally disposed abutment **48** provided on the face of the cap member **43**. A thread **49** is provided in the abutment **48** and the thread **49** cooperates with the thread on the shank **32** of the screw **31**.

The assembly of the coupling **15** with the lower part **13** of the back shell **10** and the overlapping upper part **14** of the seat shell **11** is more particularly illustrated in FIGURE 5. To effect this assembly the flexible member **36** with its surrounding circular retaining ring **40** is interposed between the lower part **13** of the upper part **14** after which the lock plate **21** is brought into contact with the lower part **13**, the teeth **20** of the latter engaging with the toothed flange **24** of the lock plate **21**. The opposed pair of dowels **35** of the lock plate **21** are located in a diametrically opposed pair of apertures **39** in the flexible member **36**. Simultaneously the cap member **43** is brought into contact with the upper part **14** of the seat shell **11**, the dowels **42** of the cap member **43** being located in the

other pair of diametrically opposed apertures **39** in the flexible member **36**; the assembly is then maintained in position by means of interengagement of the screw **31** with the threaded abutment **48** of the cap member **43**.

Interlocking adjustment of the back shell **10** in relation to the seat shell **11** is effected simply by releasing the screw **31**, withdrawing the lock plate **21** and rotating the lower part **13** of the back shell **10** to the desired position, after which the teeth **20** are reengaged with the toothed flange **24** and the whole assembly maintained in position as described above.

What I claim is:

1. In combination with a chair seat, a tiltable back and an overlapping support base comprising a flexible coupling having a first member made of resilient material interposed between said back and support base, said resilient member having two pairs of opposed apertures, a second member removed from said first member and bearing against the face of one of said back and overlapping support base, said second member having extensions traversing the nearest of said back and overlapping support base and engaging one of said pairs of apertures, a third member removed from said first member and bearing against the other of said back and overlapping support base, said third member having extensions traversing the other of said back and overlapping support base and engageable with the other of said pair of apertures, said one of said back and support base having an aperture with peripheral teeth thereon and said second member having a toothed flange engageable with said peripheral teeth to effect adjustable interlocking of said tiltable back and overlapping support base.

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