for other targets in the image. This can be useful, as can a special target which is placed on the object in such a way as to indicate the objects orientation and to identify the object itself if desired, just by looking at the target (which is known relative to the data base of the object.). See also U.S. Pat. No. 5,767,525

[0659] Both of these special target types are useful with the invention here disclosed.

[0660] **FIG. 23**

[0661] **FIG. 23** illustrates inputs to instrumentation and control systems, for example those typically encountered in car dashboards to provide added functionality and to provide aids to drivers, including the handicapped

[0662] Illustrated is an embodiment providing input to automotive control systems such as usually associated with car dashboard instrumentation to provide added functionality and to provide aids to drivers, including the handicapped. In this case the car is real, as opposed to the toy illustration of **FIG. 4** in which the dash is a toy, or even a make-believe dash, and the car is simulated in its actions via computer imagery and sounds.

[0663] As shown, driver **2301** holds gear shift lever **2302**, in the usual manner. Target datum's **2305-2308** are on his thumb and fingers, (or alternatively on a ring, or other jewelry, for example) or his wrist, and are viewed by miniature TV camera stereo pair **2320** and **2321** in the dash nearby the area of the gear lever. Light sources as appropriate are provided with the cameras, particularly of use are IR LED's **2323** and **2326** near each camera respectively.

[0664] Computer **2340** reads the output of each TV camera, and computes the position and relative position of the targets either respect to the camera pair, or each other, or to gear lever **2302** (which itself may be targeted if desired, for example with target **2310**), or to some other reference. Or the computer may simply look for motion of any object (eg a finger) or target on an object (eg a ring) above some base level of allowable motion, in the event that the user wished to signal an action just by moving his finger say (regardless of its position, or with the condition that it be within a certain window of positions say, such as between 1 and 3 O clock on the steering wheel.). Movement can be detected by comparing successive frames, or by blurred images for example.

[0665] The driver may with this embodiment, signal a large number of different actions to the computer, just by moving his fingers while holding the gear lever, or as is even more relaxing, letting his hand rest on the gear lever, with fingers pointing down as shown which points datums on the tops of his fingers toward the dash or roof section above the windshield where cameras such as **2345** and **2346** can be located relatively easily(see also armrests in **FIG. 10**). It is noted too that the steering wheel **2360**, rather than or in addition to the gear lever could also be used as point of observation of the driver (these two locations are where drivers normally rest their hands, but other places such as near armrests etc. could be chosen too). In this instance an advantageous alternate camera location is in the headliner, not shown, which allows viewing of the fingers or targets thereon from above.

[0666] Indeed the steering wheel is a natural place, where at the 10 and 2 O'Clock positions **2361** and **2362** in normal driving, one can wiggle ones thumb, or make a pinching gesture with thumb and first finger, which could be programmed to actuate any function allowed by cars control microcomputer **2350** connected to the TV camera processor **2340** (the two could be one in the same, and both likely located underdash). The program could be changed by the user if desired, such that a different motion or position gave a different control function.

[0667] Actions chosen using finger position, or relative position, or finger motion or path, could be control of heating, lighting, radio, and accessories, or for handicapped and others could even be major functions, such as throttle, brake, etc.

[0668] The data needed is analyzed, and fed by the computer to actuate the appropriate control functions of the vehicle, such as increasing fan speed, changing stations and the like.

[0669] Clearly things other than fingers could be observed by a suitable camera system of the invention. These include extremities of the body, elbows, arms, and the head. Items actuated by the driver can also be observed much like the car game or toy example of **FIG. 4** above. Very low cost and interchangeable actuator control panels could thus be sold to suit the driver whoever it was. This leads to a portion of the instrument panel being able to be individually tailored, without any change in mechanism used to acquire the data. Some people could use buttons, others sliders, and the like, to control for example, the same heating functions.

[0670] It is noted that items on the fingers or wrists can also be used as targets, such as rings, bracelets etc. It is also noted that in cars with column mounted shifters, that a single camera or set of cameras overhead or even in the top of the dash can see the drivers fingers and hands on the steering wheel and the shifter, as well as on any signal stalks on the steering column.

[0671] **FIG. 24**

[0672] **FIG. 24** illustrates a control system for use with "do it yourself" target application

[0673] LED light sources can be used advantageously as targets with the invention—especially where very high contrast is needed, especially achievable with modulated LED sources, and demodulated PSD based detectors.

[0674] However, an advantage of reflective targets, and retro-reflective targets in particular, as opposed to LED targets, is that you can easily put them on an object at very little cost, without requiring the object to have batteries, wires or the like. This means that objects not designed for the purpose, such as a young girls favorite doll can be easily equipped with small unobtrusive colored and/or retro-reflective targets (if suitable natural target features aren't available, as often the case) and this favorite toy becomes the input device to a game of doll house or the like on the screen, with suitable software support the child can have her doll playing in the White House on the screen! And audio can suit as well, for example the first lady could talk back!

[0675] To recapitulate, if you don't acquire the object with specialized targets in/on it, then you need to apply them to it, if you require the benefit of the increased brightness or contrast they can offer. While future computer advancements may make such artifices unnecessary, today many of the