The features marked with a star (*) are based entirely on material taken straight from standard research (and other Official and Therefore Always Correct) literature. Many of the other articles are genuine, too, but we don’t know which ones.

# Special Section: Clever Inventions

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The Self-Defense Wig of Dr. Nakamats* – Alice Shirrell Kaswell

The Undersea Adventure Inventions of John Ernest and Charles Williamson* – Csikszentmihalyi Aeiou

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# On the Front Cover

One of Dr. Nakamats’s more than 3500 inventions: “Cerebrex,” a BarcaLounger-class armchair that is said to improve mental functions, such as calculation and thinking, by cooling the head and heating the feet of the person who sits in it. Photo: Alice Shirrell Kaswell, taken at the World Genius Convention in Tokyo, July 2015.

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# On the Back Cover

A doctor’s office in 2015 in Medford, MA.
Humanity, beset by countless worries, devotes time and thought to preventing or solving the problem of how to match a pair of socks. Here are a few of the notable efforts.

**Anderson's Sock-Matching Innovation**

“I.D. Socks (Identification Socks),” U.S. patent 4734938, issued Apr 5, 1988, to Bruce R. Anderson. The patent document explains:

A sock (hosiery) with identification markings includes the sock, a written word description of the color of the sock, and a symbol or symbols. The word description and the symbol are permanently integrated into the sock. The user uses the markings to pair the socks after laundry, to identify the color of the socks in poor light conditions, and to keep original pairs of socks together.

This invention relates in general to socks and in particular to men's dress socks, but not limited to this category only.

Socks, for example, men's dress socks, are composed of various materials and are usually of dark, solid colors. Being of this nature, when a week's laundry is done there are many single dark socks which are difficult and tedious to pair back together. A further disadvantage is that in poor lighting conditions, as the early morning hours, it is very difficult for the businessman to tell what color socks he is putting on. A still further disadvantage is when a person has more than one pair of identical socks, bought at different times, it is difficult to pair them up based on the age of the pairs.

It is desirable to have socks which are marked in a manner such that their color may be determined under most lighting conditions.... It is also desirable to mark socks so as to indicate pairs thereof. Presently, it is impossible to tell whether two socks of the same color were originally of the same pair where more than two socks of the same color are present. In particular, this problem is encountered following laundering of the socks. Sorting of socks after laundering would be facilitated by the use of pair-indicating indicia....

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

A dress sock having indicia to indicate or markings to connote color and pairs thereof is generally indicated at 10 of FIG. 1.... A color indicating indicium or designating mark 12 is knitted into the sock at a location not visible during wear. The color indicating indicium mark 12 comprises the name of the color of the sock. For example, as shown at 12 in FIG. 1, the word “blue” has been knitted into the sock.... In addition, the color indicating indicium mark 12 is knitted in a color different from the body of the sock 10 such that there is a sufficient contrast between the two colors. This contrast will facilitate reading of the color indicating indicium mark 12 by persons unable to distinguish colors or shades.

The pair indicating indicium or designating mark 14 comprises a pair of symbols which are knitted into the sock 10 on either side of the color indicating indicium 12. The pair indicating indicium mark 14
may be one of a plurality of geometric symbols, such as triangles, stars, diamonds, squares, circles, etc. The pair indicating indicium 14 may be used to facilitate sorting of the socks after laundering....

By using a wide variety of symbols, a person can own several pairs of the same color of dress socks without having the same symbol on more than one pair.

Shofner's Sock-Matching Innovation


An improved pair of socks is disclosed for human feet. The improvement comprises providing a distinctive color indicator on each sock of the pair, in a location that will be covered by the shoe of the wearer, to facilitate pairing of the socks which comprise the pair, wherein the color of the indicator is selected so as to be capable of distinguishing the socks of the pair from other socks of similar or like color and of the same size....

When socks are not properly matched with their mates, embarrassment can result. In addition, the components of a pair that have not been matched and kept together may be worn a different number of times, and consequently laundered a different number of times. This may make subsequent attempts at matching more difficult, because the components of the pair may not appear to be identical.

It would be desirable therefore, if a sock could be provided that can readily be matched with its mate without requiring the use of rings or other devices for holding the socks together...

[As shown in FIG. 3, the] sock 10 includes as its distinctive color indicator, according to the invention, the thread that is utilized to form toe-seam 17, which thread is provided in a distinctive color, which may be black, white, or of any color that can be distinguished from the surrounding portion of the sock. Preferably, the thread which serves as the distinctive color indicator... exhibits a color or hue that is different from the color or hue of the dominant color of the sock.
Fincher’s Sock-Matching Innovation


The problem of sorting [sic] or other hosiery is well known. For example, in a family having several people including children, a relatively large number of socks may be washed in a single load of laundry. Furthermore, often several loads of laundry may be washed and dried before sorting the clothing to stow away. Often it is desired, particularly when sorting laundry for multiple persons, to be able to match and sort socks in pairs....

[It] is often difficult to sort out a matching pair of socks without spending an excessive amount of time searching. This problem is compounded where there are more than one person’s socks kept in a single drawer. Accordingly, it is desired to provide a sock having some type of marking indicia to help the sorting process, or otherwise facilitate the matching of mating pairs of socks....

[The] present invention is generally directed to an improved pair of socks... A colored identifying portion is disposed between the toe and the heel [sic], wherein the color of the colored identifying portion is different than the color of the remaining foot portion of the sock.

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Lucio Mita’s Sock-Matching Innovation

“Socks With Mark for Pairing,” European patent application 1878352A2, filed Jan 16, 2008, by Lucio Mita. The patent document explains:

It often happens that pairs of socks, especially but not exclusively men’s socks, short or long, have similar colours so that a sock can be confused and paired with another similar but not identical one. For example, a blue sock can be paired, after washing and during ironing, with a black sock. In the same way, a light grey sock can be paired with a sock of similar colour, especially when a person is in a rush to get dressed and hurriedly opens the drawer without paying attention to what he/she picks out....
The present invention aims to overcome the above-mentioned drawbacks.

The main object of the present invention is to mark pairs of socks of the same colour using a different colour from that of the sock, so that the mark stands out from the colour of the sock and therefore prevents incorrect pairing, or confusion with socks of similar colours.

Figure 1 shows a pair of socks bearing the mark of the invention on the toe;

Figure 2 shows a variant of the pair of socks of Figure 1 bearing the mark of the invention on the heel;

Figure 3 shows a variant of the pair of socks of Figure 1 bearing the mark of the invention laterally to the area of the sole of the foot;

Figure 4 shows a variant of the socks of Figure 1 bearing the mark of the invention which covers the entire toe of the sock.

Wang and Colleagues’ Sock-Matching Study

“Perception for the Manipulation of Socks,” Ping Chuan Wang, Stephen Miller, Mario Fritz, Trevor Darrell, and Pieter Abbeel, in International Conference on Intelligent Robots and Systems, 2011, pp. 4877-4884. The authors report:

We consider the perceptual challenges inherent in the robotic manipulation of previously unseen socks, with the end goal of manipulation by a household robot for laundry.

We describe novel approaches to two key perceptual problems: (i) Inferring the configuration of the sock, and (ii) determining which socks should be paired together.

[One of our main achievements is a] similarity metric for matching socks: We developed a similarity score based on a variety of visual cues (texture at different scales, color histogram]
representations, and size) for pairing socks. Our approach uses this distance metric as input to a matching algorithm to find the set of matches that maximize the sum of the matches’ similarity scores. We achieve perfect matching on our database of 100 socks and further show robustness to adding stray socks to the set.

Further detail from Ping Chuan Wang and colleagues’ sock-matching study.

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**Perception for the Manipulation of Socks**

Ping Chuan Wang, Stephen Miller, Mario Fritz, Trevor Darrell, Pieter Abbeel

*Abstract*—We consider the perceptual challenges inherent in the robotic manipulation of previously unseen socks, with the end goal of manipulation by a household robot for laundry. The task poses challenging problems in modeling the appearance, shape and configuration of these textile items that tend to exhibit high variability in texture, design, and style while being highly articulated objects.

At the heart of our approach is a holistic model of shape and appearance that facilitates manipulation of those delicate items—starting even from bunched up instances. We describe novel approaches to two key perceptual problems: (i) Inferring the configuration of the sock, and (ii) determining which socks should be paired together.

Robust inference in our model is achieved by strong texture based classifiers that, alone, are powerful enough to solve problems such as inside-out detection. Finally, a reliable prediction and contour alone offers little guidance. Furthermore, their tubular shape lends itself to highly complex configurations: the sock may be rightside-out, inside-out, or arbitrarily bunched. As it contains no overtly recognizable landmark features, the detection of its configuration requires high-level reasoning.

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Fig. 1. Given an initial image, we wish to recover the sock configuration.

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Fig. 6. There are 4 canonical modes the sock may be in: (a) Sideways, (b) Heel Up, (c) Heel Down, or (d) Bunched. Additionally, the toe may be rightside-out (top) or inside-out (bottom) for each configuration. In conjunction with 2D rotation and reflection, this suffices to capture all reasonable sock configurations.

Detail from Ping Chuan Wang and colleagues’ sock-matching study.