

INVENTION ANALYSIS AND CLAIMING: Reaching for Breadth

PART IV¹



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A recurring theme in these columns is the central role of the problem-solution statement in analyzing an invention to uncover its breadth.

Consider, for example, the coffee maker shown in FIG. 1.² When the carafe is not in place, a valve in the coffee basket prevents liquid from dripping out of the brew basket onto the burner or countertop. Sliding the carafe into place pushes up on a pin, which opens the valve and allows coffee to flow. If the carafe is removed, the valve is again closed.

A problem-solution statement for this invention is as follows:

The problem of how to shut off the flow of coffee from a coffee-maker when the carafe is not present is solved by a pin-actuated valve for the brew basket which is operated into the open position when the carafe is put in place.

The problem-solution statement serves as a foundation for the patent application’s broadest claims. Thus, like a claim, successive drafts of a problem-solution statement may be too broad or may be too narrow.

And thus also like a claim, a problem-solution statement needs to be worked over with a view toward stating the invention as broadly as possible without reading on the prior art.

CONSIDER BROADENING OUT THE PROBLEM

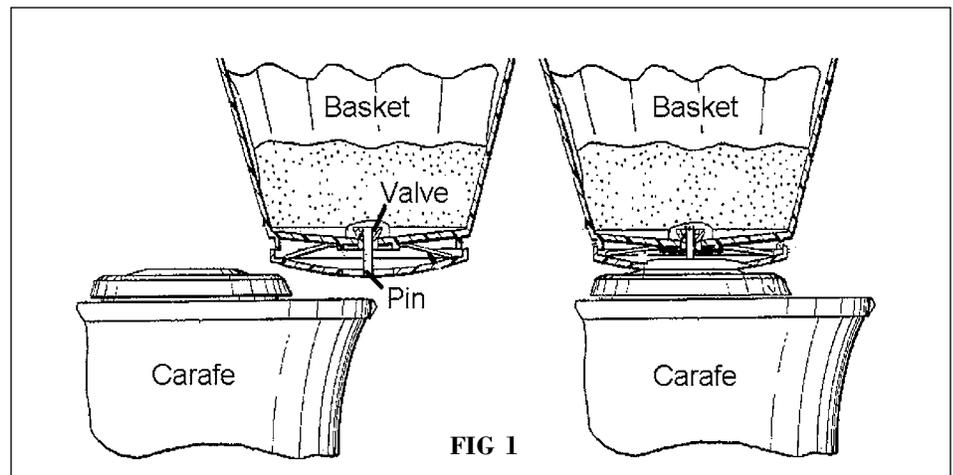
Typically, the offending language in a too-narrow problem-solution statement is in its solution section. However, it is possible for the problem to be stated too narrowly.

Indeed, that might be the case for our coffee maker.

On the one hand, the problem as stated above—the problem of how can one shut off the flow when the carafe is not present—would be *proper* if the notion of shutting off the flow was in the prior art and the inventor’s contribution was a new way of accomplishing it, namely her pin-and-valve design.

On the other hand, prior art coffee makers may not have had *any* such shut-off mechanism. In that case, the problem solved by our inventor is not how to shut off the flow in the absence of the carafe. The problem, rather, is that prior art coffee makers allowed the coffee to spill if the carafe was not present. The proper problem-solution statement under *that* scenario would be broader in both its problem section and its solution section.

The problem of coffee flowing from a coffee-maker when the carafe is not present is solved by



automatically shutting off the flow when the carafe is not present.

Note how much broader this second problem-solution statement is compared to the first and, thus, how much broader a claim based on the second problem-solution statement would be.

CONSIDER WHETHER THE CONTEXT IN WHICH THE PROBLEM ARISES IS STATED TOO NARROWLY

Another way in which the problem to get stated too narrowly is when the environment or context for the invention has not been fully explored and ultimately gets characterized too narrowly.

For example, what problem did the zipper solve? Knowing all the ways in which zippers have come to be used—clothing, zippered ring binders, back packs—it would be apparent to us today that the generic problem solved by the zipper is how to quickly and easily join and later separate the margins of two pieces of flexible material. But, the original use envisioned for the zipper was very specific. As shown in FIG. 2, the zipper’s inventor, Whitcomb Judson, developed his invention as a replacement for shoe buttons, which were tiny and required the use of a button-hook—a tedious and time-consuming process. Judson’s “clasp locker,” promised to be a boon to shoe-wearers the world over. As a result, the inventor might well have become so fixated on shoes as to overlook the possibility that the problem solved could go far beyond the problem of shoe closure. Judson and his patent attorney might therefore have developed a problem-solution statement such as the following (where the shoe-related terminology is underscored) and called it a day:

The problem(s) attendant to fastening a shoe using shoe buttons are solved by a) a row of clasps made with interlocking parts disposed on opposing flaps of the shoe which when in position, can only engage each other when at an angle to the line of strain, and b) a movable guide having two guideways which are separated at one end and converge into a single guideway at the other end.

A claim based on this problem-solution statement would similarly limit the invention to the shoe context.

Happily, Judson and his patent attorney, James Williamson, were smarter than that. Although they might have been blinded by a shoe-centric view of the invention, at least one of them understood that the problem solved was not limited to shoe closure. As related in Judson's 1893 patent,³

The invention was especially designed, for use as a shoe-fastener; but is capable of general application wherever clasps consisting of interlocking parts may be applied, as for example, to mail-bags, belts, and the closing of seams uniting flexible bodies.

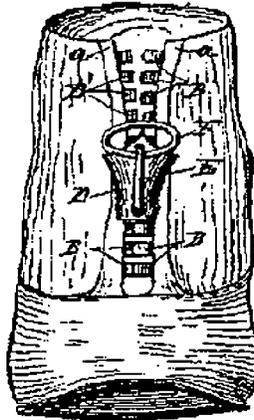
Indeed, most of the claims of the patent embody this realization, as evidenced by their preambles (emphasis added).

A device for engaging and disengaging a series of two-part clasps

upon a shoe or other article, consisting of ...

A hand device for locking or unlocking a series of two-part clasps or similar interlocking parts, which engage or disengage by an angular movement, the said device consisting of ...

A great many other pioneering inventions proved to have much wider applicability than the specific application originally envisioned by their inventors. These include



the atmospheric steam engine (originally developed to pump water out of coal mines); bar coding (railroad freight cars); and the vacuum tube amplifier (radio broadcasting). It is not important for our discussion here whether the

patents for those inventions claimed them broadly beyond the inventors' originally envisioned application, or whether technology or the marketplace would have been ready for other applications before their patents might have expired. The point is that we never know how soon the world may find uses for an invention beyond those originally contemplated by the inventor.

Thus in trying the problem-solution statement on for size, it is important to think beyond the initial problem environment to see if the problem statement is narrower than it needs to be.

To this end many of the analytical approaches helpful in broadening the solution part of the problem-solution statement can also be helpful in broadening the problem. For example,

- Ask *What Problem Is Really Being Solved?* The answer for the zipper, for example, is the problem of being able to join flexible bodies, not just shoe flaps.
- Dream up alternative, possibly even far-fetched, environments as a way of seeing the problem in a more generic context.
- See if the problem can be stated more generally by pruning and distilling it down from its current formulation.

ENDNOTES

1. Copyright © 2007, 2009 American Bar Association. Adapted with Permission. All Rights Reserved.
2. This device was presented in a somewhat different context in the January, 2008 issue of *Intellectual Property Today*.
3. U.S. Patent No. 504,038 issued August 29, 1893. Judson's embodiment didn't work all that well. An improved version, more akin to the zippers we know today, was invented by Gideon Sundback, for which he was granted U.S. Patent No. 1,219,281 in 1917.