

GLOBAL HEALTH

Innovation Insight Series



Image provided by KickStart International, photo by Esther Havens

A family with their KickStart MoneyMaker treadle pump

KICKSTART INTERNATIONAL II: Overcoming Manufacturing Challenges

NAIROBI, KENYA

ESTABLISHED 2005

MARTIN FISHER AND
NICK MOON, COFOUNDERS

THE PROBLEM/SOLUTION SPACE

The relationship between poverty and poor health is well documented. According to a recent World Bank report, “Poverty around the world creates ill-health because it forces people to live in environments that make them sick, without decent shelter, clean water or adequate sanitation.”¹ Unfortunately, more than 1 billion people around the world remain trapped in poverty (i.e., living on less than \$1.25 per day).² Alleviating poverty is especially difficult in Africa, where approximately 80 percent of the poor are rural, subsistence farmers. Some of these farmers have an entrepreneurial spirit, but with limited education and access to information, they have limited means to increase their income and climb out of poverty, so they remain at greater risk for disease and ill-health.

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ABOUT KICKSTART INTERNATIONAL

KickStart was founded by Martin Fisher and Nick Moon to design tools that would enable Africa's poor to launch and sustain profitable businesses. Its first product was a line of manually operated irrigation pumps—branded “MoneyMaker Pumps”—that would help subsistence farmers transform their farms into profitable family businesses. The pumps enable year-round irrigation, which allows farmers to grow more valuable crops, reap multiple harvests each year (instead of only one or two), remain productive during drought seasons, and increase their income substantially. The original Super MoneyMaker Pressure Pump was launched in 1998. It operated like a small StairMaster machine, consisting of two treadles powering a pressurized irrigation pump. This was followed in 2006 by the MoneyMaker Hip Pump, which resembled a bicycle pump.

ONE CHALLENGE: OVERCOMING MANUFACTURING CHALLENGES

When the first MoneyMaker pumps were brought to market, they were accepted by rural African farmers as affordable, versatile, durable, easy to maintain, and culturally appropriate. Although their design constituted a major success, KickStart subsequently

—faced significant challenges manufacturing MoneyMaker pumps in sufficient volumes and at a reasonable cost. Africa was a difficult environment for mass production due to the inconsistent strength, dimensions, and availability of requisite raw materials, shortage of skilled manufacturing labor, minimal supply of advanced capital equipment, and limited experience with modern quality control processes among manufacturers. In addition, the company's manufacturing costs were

negatively affected by the rising price of steel, which eroded the already thin margins KickStart earned on the sale of its MoneyMaker pumps in its efforts to become self-sustaining.

A prejudice leads many to assume that poor people only need poorly engineered products. Nothing is further from the truth.

THE SOLUTION: OVERSEAS PRODUCTION, DESIGN MODIFICATION, AND QUALITY CONTROL

KickStart overcame these challenges by outsourcing the manufacturing of MoneyMaker pumps to China, revising pump design, and setting high quality control standards. The move to China enabled KickStart to utilize more modern materials, as well as advanced manufacturing technologies not available in Africa. These techniques included injection molding, laser welding, and resistance welding to optimize pump quality. By centralizing production to a select number of high-performing factories, KickStart also realized economies of scale and lowered production costs. According to Ken Weimar, a KickStart senior development officer, “Manufacturing in China opens up so many more options for manufacturing that just don't exist in Kenya. We can also ship to anywhere in the world more easily from China. Like everyone else, we can manufacture more cheaply in China, which means we become more self sufficient.”³

In terms of the pumps themselves, engineers modified the designs to help reduce grow-

A sales representative points out the high quality manufacturing of the KickStart product



Image provided by KickStart International; photo by Esther Havens

ing shipping costs. The updated designs accommodated folding during shipping/transport so that the new pumps occupied only half the volume of the original pumps. This allowed KickStart to pack twice as many products in each shipping container. KickStart further reduced the cost and weight of pumps by utilizing more pre-fabricated steel and injection-molded thermoplastic components.⁴ To ensure that the pumps would remain durable despite these design modifications, engineers used computer assisted design (CAD) software and finite element analysis (FEA) to maintain the strength of hinges and other pump elements that could be strained by folding.

In addition to these design changes, Fisher insisted on a strict quality control program. Each pump was tested before being shipped from the factory and KickStart offered a replacement guarantee with each pump in the event of defects. According to Fisher, “A prejudice leads many to assume that poor people only need poorly engineered products. Nothing is further from the truth. To start successful businesses they require high-quality, well-engineered, and highly durable equipment ... this requires high-quality engineering and mass production.”⁵

KickStart was assisted in these efforts by e-Business International (e-BI), a supply chain consulting and management firm headquartered in Oregon in the United States. e-BI provided continuous remote surveillance of MoneyMaker pump production in China, as well as on-site supervising engineers. Reflecting on his decision to partner with e-BI, Fisher recalled, “We realized there would be some hand holding. But if we got involved with the wrong factory that hand holding could be very costly, because you could have a compromise in quality, could not know how to negotiate cost, and not know who to trust.... [e-BI] essentially said they could guarantee finding the factories, guarantee quality control, guarantee schedules, help line up the shipping.”⁶ KickStart’s partnership with e-BI allowed it to remain focused on the design of MoneyMaker Pumps, ways to promote them to Africa’s rural farmers, and tracking the life-changing results that were

realized through pump use. ♦

NOTES

- 1 “Dying for Change: Poor People’s Experience of Health and Ill-Health,” World Bank, <http://siteresources.worldbank.org/INTPAH/Resources/Publications/Dying-for-Change/dyifull2.pdf> (March 21, 2012).
- 2 “World Bank Updates Poverty Estimates for the Developing World,” Research at the World Bank, August 28, 2008, <http://web.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:21882162~pagePK:64165401~piPK:64165026~theSitePK:469382,00.html> (March 21, 2012).
- 3 “Interview with KickStart: Making the Anti-Poverty Pump,” Design Shakeout, March 11, 2009, <http://shakeoutblog.com/2009/03/11/interview-with-kickstart-making-the-anti-poverty-pump/> (May 16, 2012).
- 4 Joseph Ogando, “The Power of Pumps,” DesignNews, September 22, 2008, http://www.designnews.com/document.asp?doc_id=227970 (May 16, 2012).
- 5 Martin Fisher, “Income Is Development: KickStart’s Pumps Help Kenyan Farmers Transition to a Case Economy,” Innovations, Winter 2006, <http://www.mitpressjournals.org/doi/abs/10.1162/itgg.2006.1.1.9> (May 16, 2012).
- 6 “KickStart Case Study,” e-Business International, 2009, <http://www.e-bi.net/case-studies/kickstart> (May 16, 2012).